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AN

HISTORICAL INQUIRY

INTO THE

PRECIOUS METALS.

LONDON:
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AN

HISTORICAL INQUIRY

INTO THE

PRODUCTION AND CONSUMPTION

OF THE

PRECIOUS METALS.

BY WILLIAM JACOB, ESQ., F.R.S.

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IN TWO VOLUMES.

VOL. I.

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PREFACE.

THE following sheets owe their composition to the friendship with which, during more than twenty-five years, I had been honoured by the late Mr. Huskisson. It will be readily believed that his penetrating mind and assiduous habits would lead him to accurate views of the influence of the precious metals on the industry of mankind. He saw that an increase in the production of the mines might act as a stimulus to excite industry, invention, and energy; whilst a decline in their produce might have the contrary tendency. He looked with attention to other consequences which might arise from the failure or defalcation of the mines, and considered the effect of gold and silver on the *production* of wealth to be of less importance than the influence it would exercise on the *distribution* of it in the complex situation of the several classes of which modern society in Europe is composed. Whether any and to what extent a diminution in the supply from the mines

had already taken place, seemed to Mr. Huskisson an interesting subject for investigation.

My own attention had been early directed to the transatlantic possessions of Spain. By the desire of Mr. Pitt, during the short administration which preceded the death of that eminent statesman, and during the administrations which followed till the time when Spain was at peace with England, I had means furnished to me of acquiring some knowledge of those countries. My correspondence and conversation with Mr. Huskisson thus naturally and frequently fell into that channel, and nourished the feelings of interest on the subject which had been created twenty years before.

About ten years ago the expected return to specie payments by the bank made the collection of any information respecting the produce of the mines a consideration of some importance. An intimation, from one to whose friendship I felt most highly indebted, had the force of a command; and I then, at Mr. Huskisson's suggestion, framed a comparison between the actual produce of the mines of Spanish America from the years 1800 to 1810, and from 1810 to 1820. It was delivered to Lord Liverpool, and also communicated to Mr. (now Sir Robert) Peel, and to Mr. David Ricardo.

In subsequent and frequent conversations with Mr. Huskisson, he suggested the utility of taking a more comprehensive view of the subject, and of examining into the sources of those large accumulations of gold and silver which are represented to have existed in the early ages of the world—of their gradual decrease in quantity—and the causes of the disappearance of a large portion of them. These subjects he thought might be combined with the state of the prices of commodities, and connected with the renewed increase which has arisen from the discovery of America and the mining operations. The present work must be considered as an attempt to follow out the suggestions in the several quarters of the world.

I had made some progress in the collection of facts from the sacred and profane writers of antiquity, and on some other later parts of the inquiry, when the dreadful accident occurred by which his country and the world were deprived of the services of that eminent and estimable man; but in the last conversation I had with him, a few weeks before his death, he expressed much interest in the advance I had made, and assisted me by his advice in that mode of arranging the materials which has been adopted in this inquiry.

In the earlier part of this labour, I have derived much assistance from the valuable work of Heeren, professor of history in the university of Göttingen, on the commerce of the ancients. He is not referred to in the body of the book, because, though I found his work of great use in pointing out some of the ancient authors to whom I had recourse, I have not translated any whole passage; but it would be ungrateful not to acknowledge the obligation which I owe to his learning and accuracy *.

In the accounts of the application of gold and silver to other purposes than coin, I have, at least, used much diligence, and can lay claim to no other praise. If in that or any other part of this subject I have been led into errors, I shall rejoice to have them detected and rectified, having no object to seek, or to assist others in seeking for, but the truth, on a subject of importance. If this effort should induce others to investigate the whole of the history of the precious metals, or any one of the various branches of it, with more learning, more assiduity, and more success,

* The work is entitled "Ideen ueber die Politik, den Verkehr und den Handel der vornehmsten Volker der alten Welt," being the vols. ten to fifteen of the "Historische Werke." 4th edition, Göttingen, 1824.

I shall feel and cheerfully acknowledge the merit, and reserve no other claim to the approbation of the public, than that of having been the first to attempt to trace through several obscure and wide branching paths a subject in which mankind in all ages have felt a very intense degree of curiosity and interest.

The reader who shall cast his eye over the table of contents at the beginning of each volume will be put in sufficient possession of the plan of the work and the nature and object of its various divisions.

London, 16th July, 1831.

ERRATA.

Page 16, line 10, *for* Delphi, *read* Delphos.
249, line 12, *for* Pluto, *read* Plutus.

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AN INQUIRY,

ETC.

INTRODUCTION.

In the early stages of society so many and such great difficulties were opposed to the use of all metallic substances, that the discovery and application of them to the purposes of social life must have been slow and gradual.

The most ancient records of our race, the Sacred Writings, as well as the works of the earliest profane authors, have, however, communicated such intimations of the knowledge and adaptation of the more precious metals to the use of mankind, as tend to excite curiosity and to attract attention to the subject.

The general voice of antiquity affirms, that gold, silver, and copper, or brass (æs), were the first metals discovered; and that they were used partly as ornaments, and partly as instruments of war or of industry; for though, from their softness, they were not the best calculated for

the latter purposes, they were better adapted to them than those implements of flint or other hard stones, or hard wood, which had been before used by the most ancient tribes, and which were also found among the savage people inhabiting Australia, who were discovered in the middle of the last century.

A well-known passage in Hesiod affirms, that, in remote ages, "The earth was worked with brass, because iron had not then been discovered;" and Lucretius bears testimony to the same purpose in Book 5, l. 1286,

"Et prior æris erat, quam ferri, cognitus usus."

This is confirmed by the implements of copper found in the ancient mines, which will be hereafter noticed, in Siberia and in Nubia; whose working must have ceased some thousand years ago.

When Brazil was first discovered by the Portuguese, the rude inhabitants used fish hooks of gold, but had no iron, though their soil abounded in that metal. The people in Hispaniola and Mexico were, in like manner, unacquainted with iron when first visited by the Spaniards; though they had both ornaments and implements of gold, and weapons of copper; which latter, as we learn from the analysis of Humboldt, they had acquired the art of hardening by an alloy of tin.

This subject has been illustrated in Denmark, by opening many Scandinavian tumuli of very remote ages, from which have been collected specimens of knives, daggers, swords, and implements of industry, which are preserved and arranged in the Museum at Copenhagen. There are tools of various kinds formed of flint or other hard stone, in shapes resembling our wedges, axes, chisels, hammers, and knives, which are presumed to have been those first invented. There are swords, daggers, and knives, the blades of which are of gold, whilst an edge of iron is formed for the purpose of cutting. Some of the tools and weapons are formed principally of copper, with edges of iron; and in many of the implements the profuse application of copper and of gold, when contrasted with the parsimony evident in the expenditure of iron, seems to prove, that at the unknown period, and among the unknown people who raised the tumuli, which antiquarian research has lately explored, gold, as well as copper, were much more abundant products than iron[1].

Copper, in the more remote ages, was not only commonly, but in some, if not in all, exclusively used for money; and at those periods

[1] The author was much gratified, in 1827, by the inspection of the Museum, and by the clear and familiar illustrations of Mr. Thompson, who has had the arrangement of the several articles.

may be viewed as one of the precious metals; yet the changes that have since taken place have rendered gold and silver more especially entitled to that name, and will be so considered in the farther progress of this inquiry.

Some of the earliest notices which have reached the present day of the estimation of gold and silver, are in the account of the condition of Abraham, the progenitor of the Hebrew people, supposed to have lived two thousand years before our Christian era. We read "that he was rich in cattle, and in silver, and in gold[1]." On the death of his wife, he purchased a field for a burying-place, the payment for which was made with four hundred shekels of silver, which he delivered not in coin, but "by weight according to the currency of the merchants[2]."

Joseph, the great grandson of Abraham, was sold by his brethren to a caravan of Arabs travelling towards Egypt with the productions of their country, for twenty pieces of silver[3]. Afterwards, when established in Egypt as minister of the king of that country, his brothers brought "silver in their sacks' mouth," to purchase corn during a season of scarcity in their native land. In the interesting sequel of the history of Joseph, when making himself known

[1] Genesis, cap. xii. v. 2.
[2] Genesis, cap. xxiii. v. 14, 15, and 16.
[3] Genesis, cap. xxxviii. v. 29.

to his family, he presented to his younger and favourite brother three hundred pieces of silver[1].

Though gold was known at that early period and its value highly estimated, we find no intimation which can lead to the inference that it performed the function of money, either by being used as the common measure of value for other commodities, or by being employed as the medium for exchanging one kind of goods for another.

The author of the book of Job, whether, as some have supposed, a contemporary of Abraham, or, as others have thought, of a date some hundred years later, is one of the oldest writers whose works have been transmitted entire to the present day. He was not only acquainted with gold and silver, but was accurately informed of the manner in which they were procured. "Surely," says he, "there is a vein for the silver and a place for the gold where they fine it." He farther adds, "that the earth hath dust of gold[2]." Though living in a country which yields none of the precious metals, he was thus familiarly acquainted with the fact, that silver was found in veins, and gold commonly in small particles.

[1] Genesis, cap. xlv. v. 22.

[2] Job, cap. xxiii. v. 1 and 6, also 15. 17, 18, 19, 20.

Among the people with whom Job was connected, silver seems to have passed from hand to hand by weight, as money; whilst gold was appropriated like the onyx, the sapphire, crystal, pearls, topazes, rubies, and other jewels, as ornaments for the person. At the conclusion of that beautiful poem, the restored wealth of Job is reckoned up in cattle, not in money; and though his visiters brought each a piece of money, probably silver, yet each of them brought also an ear-ring of gold [1].

[1] Job, cap. xlii. v. 11 and 12.

CHAPTER I.

Of the accumulations of the precious metals from the most remote ages to the establishment of the imperial government in Rome.

Hebrews.

THERE are no intimations in the sacred writings which afford any means of forming an estimate of the whole quantity of the precious metals which had been collected in the patriarchal days. We must, therefore, rest satisfied with the scanty accounts they furnish, and proceed to later periods, when the relations of the several accumulations are more frequent, though not marked with any such precision as can inspire implicit confidence.

In the history of the reign of Solomon, as recorded in the book of Kings and in the Chronicles, we find statements of the quantities of the precious metals used in the royal palace and the holy temple erected by that monarch. We read, that "he overlaid the house within with pure gold, and made a partition by the chains of gold before the oracle, and he overlaid the oracle with gold; and the whole house he overlaid with gold till he had finished the whole

house; also the whole altar that was by the oracle he overlaid with gold[1]."

The quantity of gold which Solomon collected in a single year is stated to be (1 Kings, c. x. v. 14.) six hundred three score and six talents, or, perhaps, about three hundred thousand pounds in value in our present money. That with which he covered the sanctum sanctorum, at the same rate, would amount to about two hundred and thirty thousand pounds. We learn from the book of Kings[2], that the king brought by his ships from Ophir four hundred and twenty talents of gold, or about one hundred and ninety thousand eight hundred pounds. The book of Chronicles[3] represents the amount greater, as four hundred and fifty talents, or two hundred and three thousand pounds, a difference of no great moment, and one which, perhaps, a collation of manuscripts might reconcile.

Without attempting to calculate the quantity of metallic treasure heaped up by Solomon, we may best describe it in the language of his day. We read that "his throne was of ivory overlaid with the best gold—that all the drinking vessels were of gold—that all the vessels of the house of the forest of Lebanon were of pure gold;

[1] 1 Kings, c. iii. v. 20—22. [2] 1 Kings, c. x. v. 28.
[3] 2 Chronicles, c. viii. v. 18.

none were of silver, for that metal was nothing accounted of in the days of Solomon," and in short, "the King made silver to be as stones in Jerusalem[1]."

After this short intimation of the store of silver and gold accumulated by the Hebrew nation, it may be more proper to defer to another branch of the subject the consideration of the way in which such a store of the precious metals may probably have been collected under the reign of Solomon.

In proceeding from the sacred to the profane writers of antiquity, the reader is naturally in some degree surprised at the credulity, or at least apparent credulity, with which the most extraordinary and improbable tales are narrated. This is most remarkable in Herodotus and Diodorus, who are yet far from unworthy of confidence, where nothing supernatural is concerned. The Greek and Roman writers relate prodigies which at this day we know not whether to attribute to their own credulity, or to that of the community for which they composed their works. In either case it does not render them utterly unworthy of credit, nor destroy their testimony in matters of history, of geography, of manners, of laws, or of government.

The history of all ancient nations is filled with

[1] 1 Kings, c. x.

prodigies which are no longer believed; but if, on that account, their authority on other subjects be discarded, it will become impossible to trace the progress of mankind through the several stages of society, from the most rude to the most civilized state. It is scarcely two centuries since in every part of Europe, with all the knowledge and civilization it had imbibed, the belief in demoniacal possessions, in the power of witches and fairies, and in spectral appearances, universally prevailed. It would be unjust to the memory of the historians and chroniclers of that and the preceding ages, to reject their testimony, because they believed in supernatural events and appearances, which have lost all hold upon the present race, except among the most ignorant of the vulgar.

If in extracting from the writings of antiquity what relates more immediately to the subject of our inquiry, it should occasionally appear that incredible events are related, the sound judgment of the reader will enable him to separate the facts from the fictions in which they may be enveloped; and he may find amusement, if not instruction, in observing the great credulity of the eminent men of antiquity, and in comparing their habits of investigation and discrimination with those of the ablest writers of their own age and country.

Assyria and Persia.

It appears from the relations of Diodorus, that

large masses of gold and silver had been collected together by Ninus, the founder of Nineveh, "who possessed himself of all the treasures of Bactriana, among which was abundance of gold and silver[1]." From the same writer we learn that Semiramis, the wife of Belus, and the successor to his dominion, who built the city of Babylon, among other stupendous and almost incredibly magnificent works erected in that city, a temple to Jupiter or Belus; "upon which were placed the statues of Jupiter, of Juno, and of Rhea, all of beaten gold. That of Jupiter was standing upright, was forty feet in height, and weighed a thousand Babylonian talents.—That of Rhea was of the same height, sitting on a throne of gold, having a lion on each side of her, and one at her knees, and near them two vastly large serpents of silver, weighing thirty talents. The statue of Juno was in an erect posture, and weighed eight hundred talents. An altar was erected for these deities of beaten gold, forty feet long and fifteen broad, weighing five hundred talents, upon which were two cups, each of them weighing thirty talents, and near to them as many censers weighing three hundred talents. There were also three drinking vases of gold, the largest of which was dedicated to

[1] Diodorus, book ii. cap. 1.

Jupiter, weighing twelve hundred talents, and the other two six hundred talents each[1]."

As Diodorus wrote in the Greek language, it is probable he adopted the weights of that country, according to which the value of this mass of gold, as calculated by the Abbé Barthelemy, would amount in our money to about eleven millions sterling, whilst others estimate it at somewhat less; a difference, however, scarcely worth investigating. It is impossible not to suspect the statement here given of some exaggeration, though we may be induced to believe that a large quantity of the precious metals had been collected at that early period; but the exactness of the quantity must be a subject of doubt when it is considered that Diodorus wrote near two thousand years after the events he relates, and in an age when written records must have been both rare and of doubtful authenticity.

The probability of an accumulation of gold to a great extent in Babylon, is strengthened by the narrative in the book of Daniel, of the great size of the image of gold erected by Nebuchadnezzar, on the plain of Dura, near that city.

There is an appearance of authenticity and of accuracy in the account given by Herodotus of the tribute of gold and silver which Darius Hy-

[1] Diodorus, book ii. cap. 1.

staspes, king of Persia, about 480 years before Christ, drew from the several provinces, into which, after completing his conquests, he divided his extensive dominions.

The amount supplied by each province is stated, and whether paid in silver or in gold. "The aggregate sum," he says, "will be found to be nine thousand eight hundred and eighty talents in silver, and, estimating the gold at thirteen times the value of the silver, there will be found, according to the Euboic talent, four thousand six hundred and eighty of these talents. The whole being estimated together, it will appear that the annual tribute paid to Darius was fourteen thousand five hundred and sixty talents[1]."

This treasure is estimated by Gibbon and by Rennel to be equivalent to about three millions and a quarter sterling. According to the inference of the former writer, drawn from the same authority, in book 1, cap. 192, this revenue was the surplus, after the expenses of the maintenance of the army and of the provincial administration had been discharged. This quantity of gold and silver was probably that which became the property of the monarch, forming a kind of reserved stock to meet unforeseen contingencies.

We find, in another passage in Herodotus, a

[1] Herodotus, book iii. cap. 95.

description of the manner in which the treasure so collected was preserved in the royal residence. "The gold and silver were melted and poured into earthen vessels, and these when filled were removed, leaving the metal in a solid mass; when any was wanted, a piece was broken off, of the capacity which the occasion required[1]." It seemed, as far as regarded Darius, to be the practice to coin no more gold and silver than was needed to conduct the commerce and to defray the expenses of the state[2], which at that period could not be of any large amount, from the paucity of commodities which were the subjects of exchange, and from the low prices which all the necessaries and conveniences of life bore.

It is not improbable that this reserve fund was carefully kept from circulation by hoarding, as a preparation for the grand campaign against the Greeks, which must have formed a part of the warlike operations projected by the Persian monarch and his ministers. We learn that Xerxes took with him into the field so much money and valuable effects as formed loading for twelve hundred camels[3], and upon the disastrous events which attended his invasion was under the necessity of distributing large sums to the mercenary troops who had accompanied him to the

[1] Herodotus, book iii. cap. 96.
[2] Strabo, book xv. p. 505.
[3] Demosth. de Symm.

field, and that Sparta alone received from him five thousand talents[1]."

Darius coined pieces of gold of great purity, which obtained the name of darics. They were about the value of twenty-five shillings of our present money. The name daric was at subsequent periods, however, given generally to all gold coins which contained but little alloy, and thus indicated the purity of the metal, rather than the weight of the piece. The darics of this coinage were few in number and contracted in circulation, or more of them would have been handed down to posterity. It is said, there are but two now known to exist, one of which is in the collection of Lord Pembroke. The figure of an archer is stamped on it, which gave rise to an ancient witticism that may be worth relating. Agesilaus, king of Sparta, received from Darius a bribe of thirty thousand darics to withdraw from the other Grecian states with whom he was in alliance. Being reproached for his treachery, he defended himself, by asserting that his operations had been suspended, owing to his having been defeated by thirty thousand archers.

The wealth of Crœsus, king of Lydia, who lived about 540 years before Christ, has become proverbial; and, though no precise communication of the extent of it has been handed down, Greece.

[1] Isocrat. Συμμαχ. 32.

we may form some estimate of it, by the munificent presents he made to the temple of Delphi, as related by Herodotus[1] and Diodorus[2], amounting to four thousand talents of silver and two hundred and seventy talents of gold, or near three millions in value of our money.

We find in Herodotus a story illustrative both of the wealth of this king and of the manners of his time. When Crœsus sent his Lydians from Sardis to consult the oracle at Delphi, they were received with hospitality by the family of the Alcmæonidæ at Athens, and, on their return, acquainted their master with the kindness they had experienced. A member of that family received an invitation to visit Crœsus, and on his arrival was presented with as much gold as he was able to carry[3]. "To improve the value of the gift, Alcmæon made use of the following artifice. Providing himself with a large tunic, in which were many folds, and with the most capacious buskins he could procure, he followed his guide to the royal treasury; there, rolling himself among the golden ingots, he first stuffed his buskins as full of gold as he possibly could; he then filled all the folds of his robes, his hair, and even his mouth with gold dust. This done,

[1] Herodotus, b. i. c. 50. [2] Diodorus, b. xvi. c. 56.
[3] Herodotus, b. vi. c. 105.

with extreme difficulty he staggered from the place; from his swelling mouth, and projections all around him, resembling any thing rather than a man. When Crœsus saw him he burst into laughter, and not only suffered him to carry away all he had got, but added to it other presents equally valuable. The family from this circumstance became exceedingly affluent, and Alcmæon was enabled to procure and maintain those horses which gained him the victory in the Olympic games."

Whatever may have been the real wealth of Crœsus, it would appear that gold must have been of very high value in Athens, when such a load as an individual could carry about his person in the way here described could be sufficient to form the foundation of the fortunes of one of the aristocratical families of that state.

Pytheus, king of the petty territory of Celæna in Phrygia, has been celebrated for his great wealth. According to Herodotus, he was a native of Lydia; but according to Pliny, of Bithynia; and it does not appear in what manner he became possessed of the rich territory he ruled. It is related of this man by Herodotus, that "when Xerxes invaded Greece (about 470 years before Christ), he entertained that monarch and his whole army with great magnificence; and being asked the amount of his wealth, replied to Xerxes, 'I conceal nothing from you, and will

not affect ignorance, but fairly tell you the whole. As soon as I heard of your approach to the Grecian sea, I was desirous of giving you money for the war. On examining into the state of my affairs, I found I was possessed of two thousand talents of silver, and four millions, wanting only seven thousand, staters of gold of Darius: all this I give to you; my slaves and my farms will be sufficient to maintain me[1].'" According to the estimate of Larcher, an able French critic[2], the metallic treasures of this man, the ruler of a small territory, but the proprietor of rich mines of silver and gold, amounted to three millions six hundred thousand pounds of our present money.

A long account of this man has been collected by Larcher, chiefly from the work of Plutarch "De Virtutibus Mulierum." It narrates the measures taken by his wife to cure him of that passion for seeking gold to which the lives of his subjects were sacrificed, and by which a want of sufficient food for subsistence was caused. As the story has been frequently told, and must be familiar to most readers, we may dispense with the relation of it.

The application of the labour of all the inhabitants to the searching for and purifying gold

[1] Herodotus, book iii. cap. 26, 27.

[2] Larcher's notes on Herodotus, vol. ii. p. 356.

caused such distress for food, that at length Pytheus was induced to direct that only one-fifth instead of the whole of the citizens should in future be compelled to devote themselves to those operations.

The story of Pytheus is important to one of the objects of the present inquiry, inasmuch as it shows, as far as regards the particular case, that the acquisition of gold and silver was only to be obtained, in that remote period, by the mines being in the hands of severe as well as arbitrary despots, who spared neither the enjoyments, the labour, nor even the lives of their subjects in the eager pursuit after the metallic riches of their dominions.

It does not appear that the free states of Greece possessed a store of gold and silver equal to that acquired by these absolute rulers of smaller portions of territory. When[1] Pericles, in order to animate the Athenians in their defence against the Peloponnesians, about the year 431 before Christ, addressed them, he stated the amount of the money then in the citadel to be one million one hundred sixty-two thousand two hundred and fifty pounds; and in addition to that the gold in the statue of Minerva, which must be replaced if appropriated to the public service, to amount to one hundred twenty-four

[1] Thucydides' Peloponnesian War, book ii.

thousand eight hundred pounds. The revenues derived from the tributary states amounted annually to the sum of one hundred sixteen thousand two hundred and fifty pounds, and more than seven hundred thousand pounds had been expended in improving the public works[1].

The mass of the precious metals brought from the eastern to the western world by Alexander must have been enormous, though much of that captured was expended in the subjugated countries, and in those which were between them and Greece. The accounts of historians are probably exaggerated; but whatever allowance may be made for such a practice, which was too common with the ancients, we must be convinced from the numerous authorities[2] which bear testimony to the facts, and corroborate each other, that the accumulation in the hands of individual monarchs and states was much greater about the time of the establishment of the full power of the Roman empire than at any subsequent period.

The treasures acquired by Alexander in Susa and Persia, exclusive of those which were found in the Persian camp and in Babylon, are stated by the authors above referred to and others, by some at

[1] The sums here stated are taken according to the calculation of Dean Smith, the learned translator of Thucydides.

[2] Strabo, 615, p. 502.—Arrian, iii. 3.—Justin, xi. 14.—And Plutarch, Vit. Alex. 36.

forty, by others at fifty thousand talents. The treasure of Persepolis is rated at one hundred and twenty thousand talents; that of Pasagarda at six thousand; and upon the capture of Ecbatana, according to the account preserved in Strabo, one hundred and eighty thousand talents are said to have been collected from thence, besides six thousand talents which Darius had with him, which were taken by his murderers.

Alexander's profuse expenditure, which his flatterers called generosity, was in accordance with the vast sums he seems to have acquired. He gave great rewards to his soldiers, and paid their debts, amounting to nine thousand eight hundred talents. He presented to the Thessalians two thousand talents. The funeral of Hephæstion is said to have cost twelve thousand talents, and the researches in natural history, for the works of Aristotle, eight hundred talents.

The wealth of his satraps was also enormous. Harpalus, one of them, is said to have amassed fifty thousand talents, although, when at Athens, he denied the possession of more than nine hundred and fifty[1]. The successors of Alexander, also, collected large sums; though, by their extensive and fierce wars, the greater part was dissipated.

In Polybius is found a description of Ecba-

[1] Diodorus, xvii. 108. Lives of the Ten Orators.

tana, at a period subsequent to the capture of that place by Alexander; and, afterwards, in the reigns of Antigonus and Seleucus.

"The magnificence of the palace," he says, "was such in every part, as to give a high idea of the power and wealth of those by whom it had been erected; for, though the wood of it was all cypress or cedar, no part of it was left naked; yet the beams, the roofs, and the pillars that supported the porticos and peristyles, were all covered with plates, some of silver and some of gold. The tiles, likewise, were all of silver. Though the place had been three times plundered by those we have named, before Antiochus arrived, there was still remaining, in the temple of Ena, some pillars cased with gold, and a large quantity of silver tiles, laid together in a heap. There were also some few wedges of gold, and a much greater number of silver. These were coined into money, and amounted to the sum of about five thousand talents[1]."

Ptolemy Philadelphus, the second king of Egypt after Alexander, is stated by Appian[2], upon the authority of official documents, to have possessed treasure to the enormous amount of seven hundred and forty thousand talents: either Roman talents or the small Ptolemaic talent. If the former, which were about equal to the Attic

[1] Polybius, book v. cap. 9.

[2] Hist. Rom. procem. 10.

talent, be rendered into money of the present day, it will give the amount as one hundred and seventy-eight millions. If the smaller talent, which seems most correct, be taken, it will amount to at least one quarter of that sum. Though an account of this kind may appear exaggerated, yet there seems no reason to doubt its general veracity. The revenues of the Ptolemies were excessively large, and the countries over which their dominions extended were, by the collections, completely drained of all their wrought gold and silver; and the tributes were collected by the farmers of the revenue with the assistance of an armed force, composed, not of regular soldiers, but of organized bands of robbers.

Some idea of the degree of rapacity in extracting revenue under Ptolemy may be formed by comparing the tribute drawn from the provinces of Cœlesyria, Palestine, and Samaria, under Cyrus, as given by Herodotus, and that extorted by the successor of Alexander, as given by Josephus. At the time of Cyrus, the island of Cyprus was included in the province of Cœlesyria, but in the time of Ptolemy was separated from it. In the first instance, the tribute paid was three hundred and fifty talents [1]. In the latter instance, it was farmed to Euergetes

[1] Herodotus, book iii. cap. 89.

for eight thousand talents; but, if the taxes were farmed by a Jew, he was to pay double that amount, and moreover supply to the royal treasury the money required to redeem the confiscated goods of such persons as had not paid their taxes [1].

During the period of the Macedonian empire, the precious metals were spread in great abundance over the whole eastern shores of the Mediterranean; and if there had not been a very large portion of them hoarded up in the royal treasury, their value must have fallen much lower, in comparison with other commodities, than was actually the case [2].

The Romans.

The extension of the Roman empire, until it comprehended almost the whole of the known world, if it tended to diminish the production of the precious metals, powerfully attracted them, from Asia and Africa, to its own metropolis. It is thus that the enormous fortunes of individuals which are related by the historians are to be accounted for. The descriptions of such fortunes, it is true, are not confined to their mere metallic wealth, but include their lands, houses, slaves, and furniture, and also

[1] Josephus Antiq. Jud. xii. 4.

[2] See, on this subject, the valuable German work of Professor Bœckh, entitled "Staatshausholtung der Athener," an excellent translation of which was published in 1828, under the title of "Public Economy of Athens."

money lent at interest on mortgages, or other securities. But unless the metallic wealth had increased in a prodigious degree, that remarkable rise in the prices of other commodities could not have been experienced which is noticed by all writers. As one among other instances, we know that the house of Marius[1], at Misenum, was purchased by Cornelia for seventy-five thousand drachmas[2], and a few years after sold to Lucullus for five hundred thousand two hundred drachmas[3].

The fortunes of private individuals may be judged of by a few select notices to be found in contemporary authors. Crassus is said to have possessed in lands *bis millies*[4], besides money, slaves, and household furniture, estimated at as much more[5]. Seneca is related to have pos-

[1] Plutarch. in Mario. [2] £2421. 17*s*. 6*d*. sterling.

[3] £16,152. 5*s*. 10*d*. sterling.

[4] £1,614,583. 6*s*. 8*d*. sterling.

[5] Though Crassus had several silver mines and estates of great value, which were profitably managed, yet his revenues from those sources are represented as inconsiderable, when compared with those he derived from his slaves. He had a large number of them, whom he educated, who were taught to become readers, amanuenses, book-keepers, stewards, and cooks. Besides this he made interest of his money, at a high rate, receiving for the use of it one per cent. at the end of each month. It is recorded as a saying of his, "that no man could be accounted rich who was not able to maintain an army out of his own revenues." It should seem that when he was desirous to form a powerful party in the state, he could be occasionally as profuse as he was habitually avaricious; for on

sessed *ter millies*[1]. Pallas, the freedman of Claudius, an equal sum. Lentulus, the augur, *quater millies*[2]. C. C. Claudius Isidorus, although he had lost a great part of his fortune in the civil wars, left by his will four thousand one hundred and sixteen slaves, three thousand six hundred yoke of oxen, two hundred and fifty-seven thousand head of other cattle, and in ready money *HS. sexcenties*[3].

The emperors were possessed of wealth in a proportion commensurate with their superior rank and power. Augustus obtained, by the testamentary dispositions of his friends, *quater decies millies*[4]. Tiberius left at his death *vigesies ac septies millies*[5], which Caligula lavished away in a single year.

The expenses of the government, and the debts and credits of the most eminent individuals, seem to have been on the same colossal scale. Vespasian, at his accession, estimated the money which the maintenance of the commonwealth required at three hundred and twenty-two millions nine hundred sixteen thousand six hundred and sixty pounds.

one occasion he gave an entertainment to the populace, who were seated at ten thousand tables, and at another time gave them a supply of bread-corn for three months.—*Plutarch, Life of M. Crassus.*

[1] £2,421,875 sterling.
[2] £3,229,166 sterling.
[3] £484,375 sterling.
[4] £32,291,666 sterling.
[5] £21,796,875 sterling.

The debts of Milo amounted to *HS. septengenties*[1]. Julius Cæsar, before he held any office, owed thirteen hundred talents; when, after his pretorship, he set out for Spain, he is reported to have said, *Bis millies et quingenties sibi deesse, ut nihil haberet;* that is, that he was two millions and eighteen thousand pounds worse than nothing. When he first entered Rome, at the beginning of the civil war, he took out of the treasury to the amount of one million and ninety-five thousand pounds sterling, and brought into it, at the end of that war, four millions eight hundred and forty-three thousand pounds. He is reported to have purchased the friendship of Curio, at the commencement of the civil contests, by a bribe of four hundred eighty-four thousand three hundred and seventy pounds; and that of the consul L. Paulus, the colleague of Marcellus, by one of two hundred seventy-nine thousand five hundred pounds[2].

Anthony, on the ides of March, when Cæsar was killed, owed three hundred and twenty thousand pounds, which he paid before the kalends of April, and squandered of the public

[1] £565,104 sterling.

[2] It is remarked by Pliny (book xxxiii. cap. 3.), that the city of Rome never possessed so much money as at the beginning of the war between Cæsar and Pompey.

money more than five millions six hundred thousand pounds [1].

Many other instances might be found of vast masses of wealth being collected, of large debts being contracted, and of prodigious sums being expended, either on public occasions, or in private indulgences of the dress, the tables, or the furniture of the Romans, just after the acquisition of universal empire. At that period the treasure, which had been acquired by conquest, had not been generally diffused in the hands of numerous individuals, nor had much of it been consumed by the friction which the practice, soon after extended, of converting large quantities of it into coined money, necessarily occasioned.

[1] See Adam's Roman Antiquities, 9th edit. p. 461, from whence, as far as regards Rome, the facts are selected, and where the evidence on which each of them rests is pointed out.

CHAPTER II.

On the mines of the ancients in the several parts of the world.

HAVING taken a survey of the great accumulation of the precious metals which had been formed in the early ages of the world, we may attempt to trace out the various sources from which they had been collected, as well as the means used for obtaining and adapting them to the purposes of human life. Asia east of Persia.

Herodotus has given, in his third book, cap. 89—97, an account of the satrapies or provinces into which Darius, after the conquest of Babylon, divided his vast dominions. The division was made for the purposes of taxation, and the account shows the amount of the tribute imposed on the several portions of his empire. This may serve as a guide to the various countries which were believed to be capable of furnishing to the royal treasury supplies of gold and silver. It does not, however, enable us to ascertain what portion of those metals was the product of the country from which it was required, or what part of it was obtained in such country by

means of the commerce of the inhabitants with those of other divisions of the world. Thus Phœnicia, and Palestine, and the land to the frontier of Egypt were taxed at three hundred and fifty talents of silver, though neither gold nor silver, nor any metal, except some copper from Sarephta, was produced in the country.

It seems probable that the precious metals were first known to mankind in the eastern parts of Asia and in Egypt, but which of those countries is entitled to a priority in the discovery it is now almost impossible to determine. The tribute imposed by the law of Darius shows their wealth in general, as compared with the other divisions of his dominions. Thus, in eastern Asia, "Babylon and the other parts of Assyria, which formed the ninth satrapy, paid a thousand talents of silver. Ecbatana, the rest of Media, with the Parycanii and Orthocorybantes, which was the tenth satrapy, furnished four hundred and fifty talents. The Caspians, the Daritæ, and some others, composing the eleventh satrapy, contributed two hundred talents. The country of the Bactrians, or twelfth satrapy, furnished three hundred and sixty talents; to which may be added Susa, and the rest of the Cessians, who supplied three hundred talents." Thus the eastern part of Asia, exclusive of India, which "supplied six hundred talents in golden ingots," afforded nearly one half of the whole metallic

tribute imposed by Darius. These satrapies comprehended the whole of that part of Asia which is to the eastward of the Tigris, and, extending along the border of the Caspian sea, contains within its boundaries Persia, Siberia, Tartary, and whatever was known to the Persians in the days of Darius of Thibet, China, and India beyond the Ganges. They are now known to contain veins of the precious metals, some few of which still yield gold and silver, but which were worked to a greater extent in former ages. Herodotus[1] particularly notices those people as employed in searching for gold who live in the country of Pactijica, near the sources of the Indus, and who are said by him to resemble the Bactrians. This district, fertile in gold, is on the eastern border of Great Bactriana, where the chain of the Taurus mountains divides into two ranges, which almost surround Little Bactriana and the desert steppes of Cobbi. The rivers which descend from these mountains give sufficient evidence by their washings that gold was abundant, some of which was procured partly from washing the sand, more by digging, but most by a fabulous mode of procuring it, which may at least be amusing to relate[2], though it may not obtain much credit, even when sanc-

[1] Herodot. b. iii. cap. 102, and Abulgasi, Hist. des Tartares, p. 388.

[2] Herodot. b. iii. cap. 106.

tioned by the testimony of Pliny[1]. "In the vicinity of the Bactrians, who are distinguished for their bravery, and are employed in searching for gold, there are vast deserts of sand, in which a species of ants is produced, not so large as a dog, but bigger than a fox. Some of these, taken by hunting, are preserved in the palace of the Persian monarch. Like the ants common in Greece, which in form also they nearly resemble, they make themselves habitations in the ground, by digging under the sand. The sand thus thrown up is mixed with gold dust, to collect which the Indians are despatched into the deserts. They proceed on this expedition with three camels fastened together; a female being secured between two males, and upon her the Indian is seated, taking care to select one that has recently foaled. The females of this description are quite as swift as horses, and capable of bearing much heavier burdens. Having thus connected their camels, the Indians proceed in search of the gold, choosing the hottest time of the day as most proper for their purpose, for then it is that the ants conceal themselves under the earth. As soon as they arrive at the spot, the Indians precipitately fill their bags with sand, and return as expeditiously as possible. The Persians say that these ants know

[1] Pliny, b. xxxiii. cap. 1.

and pursue the Indians by their smell with incredible swiftness. They affirm, that if the Indians did not make considerable progress whilst the ants were collecting themselves together, it would be impossible for any of them to escape. For this reason, at different intervals, they separate one of the male camels from the female, which are always fleeter than the males, and are at this time additionally incited by the remembrance of their young whom they had left. It is thus, according to the Persians, the Indians obtain their greatest quantity of gold; what they procure by digging is of much inferior importance."—Beloe's Herodotus, vol. ii. p. 281—287.

Though the father of history may have been too credulous in receiving these tales of ants—in size between a dog and a fox—of their labour in digging up heaps of gold—and their swift pursuit of the plunderers of their hoards—his relation confirms the general view every inquirer must take, that the produce of gold from mines is very far inferior in quantity to that procured in the form of dust, which, in spite of both Herodotus and Pliny, seems to be chiefly, but not exclusively, gained by washing the sand brought down by mountain torrents.

It is more than probable that the countries to the north of Persia, though unknown except by rumour to the more refined inhabitants of central Asia, contributed in some degree to increase

the supply of gold. The knowledge of the Greeks in the time of Herodotus was comprised in an acquaintance with those people who lived to the south of the Altai mountains, which the discoveries of the Russians have proved to be the barrier between Bactriana and Siberia. Now it is stated, respecting several of the Nomadic tribes to the north of those mountains, that they had gold in abundance. It is not with a design to show the credulity of our author, but to account for the apparent discrepancies which represent gold as an abundant article in the Persian dominions, and yet describe the sources of it so few and feeble, that reference is here made to Herodotus. That writer says, that "in the north there is a prodigious quantity of gold, but how it is produced I am not able to tell with certainty. It is affirmed indeed that the Arimaspi, a people who have but one eye, take the gold away by violence from the griffins; but I can never persuade myself that there are any men who, having but one eye, enjoy in all other respects the nature and qualities of all other human beings[1]." A modern would scarcely give more credit to the story of griffins being the guardians of gold than to that of their plunderers, the nation of the Arimaspi, having but one eye! The researches of travellers from

[1] Herodotus, b. iii. cap. 116.

Russia have within the last century thrown some light on the mining operations of the ancients in this part of Asia, and deserve attention. We are unacquainted with even the names of the Nomadic tribes by whom the mines in Siberia were worked, but it may be safely inferred from the discoveries that have been made, that their operations were carried on before the conquest of Siberia by the Tartars[1]. We know that the Tartars were acquainted with the use of iron, that they had weapons and implements of that metal; but the tribes who excavated the mines of Siberia had no iron, and used implements of no other metal than copper or brass. The conquest of this part of Asia by the Tartars was effected about 150 years before our era, and it seems to be hence inferible that the mines must have been worked prior to that period. It is remarkable that the mines which the late travellers have discovered are in districts abounding with iron ore, though none of it appeared to have been worked.

The remains of the mines have been traced by Gmelin, Lepechin, and Pallas, on the southern and eastern borders of the Ural mountains.

[1] Histoire généalogique des Tartares de Abulgasi, as quoted by Johann Eberhard Fischer, in his work printed at Petersburgh, in 1768, entitled "Sibirische Geschichte von der entdekkung Sibiriens bis auf die eroberung dieses Landes durch die Russische waffen"

That they were the work of a Nomadic people, probably the Scythians, is conjectured from there being no remains of buildings of masonry near them. The extent of the works show that the workmen must have been numerous, whilst an inspection of them proves that only the first rudiments of the science of mining could have been known to them.

Besides some implements the use of which is unknown, there were wedges and hammers, all of copper[1], that had been smelted, but without any particles of gold in them. Instead of sledges, they seem to have used large stones of a long shape, on which are to be seen marks which show that handles had been fastened to them[2]. They seem to have scraped out the gold with the fangs of the boars, and collected it in leather bags or pockets, some of which have been found. With such imperfect implements, the work of excavation must have required the labour of a great number of hands for a long time, and in some cases must have exhausted their patience.

In one instance, after having proceeded to some depth, and reached a bed of hard stones, the work, after penetrating a little way, had been abandoned. Some of the pits are twenty fathoms in depth, shaped like a well, and are about seven

[1] Pallas Reise, vol. 2. sect. 608.

[2] Lepechin, part 2. sect. 89.

feet in diameter. The passages and props are well executed, but the former so narrow and low that it must have been difficult to have worked in them. The natural pillars left to support the roofs are in some instances still effectual for that purpose, and in these are still found small portions of copper ore, containing particles of gold; in other instances, the supports have given way, and in them are found some human bones, probably of those who had been buried in the ruins. That a great number of people were employed is inferred from the numerous fragments of earthenware which are found scattered to a great distance around.

It appears that only the richest ores were worked, and some of them must have been smelted in the mines; for in the rubbish of one of the supports which had fallen in, there has been found melted copper, and the implement for smelting it: some of these implements also have been found on the surface near the pits. The operation of crushing as well as washing the ores was performed in the rivulets, and, as is supposed, the latter was omitted in the rich ores, which were found on elevated spots. The smelting, whether in the mines or on the surface, was performed in small furnaces, of which Gmelin observed near a thousand in the eastern parts of Siberia. They were made of red bricks, and in them pieces of melted copper, from two to three pounds in

weight, have been found. The[1] height and breadth of these furnaces were about two feet, and the length three feet. There were holes on both the front and back sides, but which of them was appropriated for the bellows could not be discovered by any marks. In the neighbourhood of these furnaces there are large heaps of scoriæ ; but no one has had the curiosity to ascertain what metals, if any, they contain. It may be presumed that a long period must have elapsed since the works were in activity, for the roots of large fir trees have spread themselves among the stones that are heaped against the sides of the furnaces.

It appears strange that the ancient inhabitants of this country, with their imperfect means, should have been able to melt so hard a metal as copper, and should have acquired the art of separating the gold from it. It is now impossible to form any judgment of the portion of gold which the copper contained; but the fact of some being found is sufficiently proved, and it may have given rise to the puerile tales that have been noticed, and which Herodotus has transmitted to the ages that have succeeded to his.

Gmelin found in the eastern parts of Siberia remains of works which had belonged to silver mines, and remarked that the lead with

[1] Gmelin, vol. 3. sect. 299.

which it had existed in the ore was all left, whilst the silver had been taken, and only small particles suffered to remain mingled with the scoriæ[1].

The silver and gold collected as tribute in the capital of the Persian empire, if hoarded there, as seems probable, will serve to account for the vast store found by Alexander in that city and in the surrounding countries. The tribute of India alone would in a few years be almost sufficient to furnish a stock of gold, which, when dispersed, would have an effect on the whole of the then known world. We have but few notices of the places from which the gold and silver of India were obtained. They are mentioned by Pliny, but not in a way to communicate any precise information of the quantity of their produce; and the names given to the places in which those metals were found are such as make their situation doubtful. "The Dardaneans," he says, "inhabit a country the richest of all India in gold mines, and the Selians have the most abundant mines of silver[2]." "In the country of the Naræans, on the other side the mountain Capitalia, there are a very great number of mines both of gold and silver, in which the Indians work very extensively[3]." "Just without the mouth of the river

Persia and India.

[1] Gmelin, vol. 3. p. 300 and 304.

[2] Pliny, b. vi. cap. 19.

[3] Idem, b. vi. cap. 20.

Indus, there are two islands named Chryse and Argyre, so called, as I think, from the mines of gold and silver which are found there; for I cannot believe what some have asserted, that the soil on them consists wholly of those metals[1]."

We know both from Strabo and Pliny, that a trade by caravans was carried on in remote ages between Babylon and India, and though we know not what commodities the former supplied to the latter, yet we may safely presume that gold, if not silver, formed a part of the articles which the Indians gave in exchange.

Egypt and Nubia.

Neither any of the relations of ancient history, nor any of the more recent examinations of that country, afford ground to believe that Egypt below the cataracts contained mines of gold or silver, although we know from the most authentic accounts, that at an early period the Tyrians and other Phœnicians, and at a later period the Persians, after the conquest of that country by Cambyses, drew from thence large quantities of both those metals.

In the provincial division of his dominions by Darius, it was denominated the sixth satrapy; and we are informed that "seven hundred talents were annually required from Egypt and the Africans which border on Egypt, which are comprehended in the Egyptian district." The

[1] Pliny, b. vi. cap. 21.

produce of the lake Mœris was not included in this sum, neither was the corn to the amount of seven thousand talents more; one hundred and twenty thousand measures of which were applied to the maintenance of the Persians, and their auxiliary troops garrisoned within the castle of Memphis[1]. The mineral wealth which existed in Egypt in its most flourishing times must have been partly transferred thither by means of commerce from other territories. Egypt was then a manufacturing and an agricultural country, and furnished from both descriptions of their products the means of attracting to it the metallic wealth of other districts. Egypt was especially productive of flax[2] and of cotton[3], and at an early period supplied to the Phœnicians the raw materials for their extensive manufactories of both those kinds of goods. It also abounded with corn; and when the Hebrews who usually supplied the Phœnicians with that necessary had an insufficient quantity, a supply was drawn from the banks of the Nile. We

[1] Herodotus, b. iii. cap. 91.

[2] See Exodus, chap. ix. v. 31, where the destruction of the crop of flax by a storm of hail is noticed.

[3] Pliny, b. xix. c. 2. Superior pars Ægypti, in Arabiam vergens, gignit fruticem, quem alii gossipium vocant, plures xylina, et ideo lina facta xylina; nec ulla sunt candore mollitieve preferenda. Vestes inde sacerdotibus Ægypti gratissimæ.

know too from the history of Joseph, that his father sent from Arabia for food for his family. It is also well ascertained that cotton, silk, and linen cloth was made by the Egyptians. This is asserted by ancient history, and confirmed by recent proofs; for cloth of those substances has been found in the mummies taken from the royal sepulchres by Belzoni and others.

The chief sources of the wealth of the Pharaohs, however, were the mines of the neighbouring countries of Nubia and Ethiopia, which were productive of copper or brass in great abundance, before iron was known in Africa. According to the testimony of Agatharchidas of Cnidus, who wrote about 170 or 180 years before our era, the abundance of brass was such, that it formed the chief parts of the domestic furniture, as well as of the chariots, the swords, the bows, and the arrows, in use in a prior age. The mines which produced the copper yielded also gold, which the Africans separated from the less valuable metal. There is an exact and almost technical description of those mines by an eyewitness, who visited them in the reign of the fourth Ptolemy[1]. "They are," he says, "near the mountain Altahi, not far from the ancient Berenice Panchrysos, in

[1] Agatharchidas de Rubro Mari, in Diodorus, b. iii. c. 12—15.

latitude 22° north[1]. They were worked by a numerous body of people, including men, women, and children, to each of whom a portion of labour was assigned, correspondent to their strength and skill. The discovery of them was made by the kings of the ancient race. The operations in the mines of Nubia were interrupted by the invasion of the Ethiopians, who took possession of them[2], and afterwards by the Medes and Persians. In the passages of the mines were found many tools of brass, iron being then unknown, and vast masses of human bones, of people who had been buried in the ruins. The extent of the subterraneous galleries is so great that they must almost have reached to the sea."

Some recent communications have thrown light on the subject of these mines. They are said to be at Alaki, fifteen days' journey from the Nile. The nearest city to them is Assuan[3]. The inquiries of Belzoni have also led him to discover mines in the range of the Zahara mountains, only six hours' journey from the Red Sea, in latitude 24° 30'. They are represented as very extensive, and as having been worked during a long space

[1] The exactness of this position has been since proved by D'Anville, in Memoire sur l'Egypte, p. 274.

[2] The Ethiopians overran Egypt between 700 and 800 years before Christ.

[3] Quatremere, Memoires sur l'Egypte, vol. ii. p. 175, &c.

of time; the remains of ancient Egyptian buildings on the road to the spot show that the period of their working must have been very remote. It is highly probable they were productive until the end of the sovereignty of the Pharaohs; and, according to Theophrastus[1], the produce was the property of the monarchs, as they will be of the present pacha of Egypt, if the attempts he is reported to be making to open these mines anew should be attended with success. An Arabian author, Massudi, quoted by Quatremere, calls the place Kharbal, and says, it is in a mountainous desert, eight days' journey from the Nile; and that some mines were worked near that place till the fourteenth or fifteenth century. If this last assertion be correct, it may not be too much to suppose that the discovery of the mines of America might have extended their influence so far as to make the working of these Nubian mines an unprofitable operation. It is however probable, that if these mines were continued to the late period noticed by the Arabian writer, the operations must have been carried on upon a very contracted scale.

We may find in the history of that country sufficient causes, in the sufferings inflicted on it by civil dissensions and by foreign invasions, to account for the abandonment of a pursuit so little

[1] Theophrastus de Lapidibus.

profitable and so highly hazardous as that of searching for the precious metals.

The civil dissensions began soon after the repulse of the Ethiopians, which has been already noticed. The causes of these may be traced to their theocratic constitution, under which the kings received from the priests the supposed commands of the Divinity. The people were divided into hereditary castes. Next to the priesthood the warriors were the most powerful; but these latter, being discontented with the conduct of Sethon, who had united in himself the royal and sacerdotal character, refused their services, when Sennacherib, king of Assyria, invaded the country. The confusion which prevailed in Egypt at this invasion is thus described by Isaiah, chap. xix.: "I will set the Egyptians against the Egyptians: and they shall fight every one against his brother, and every one against his neighbour; city against city, and kingdom against kingdom. And the spirit of Egypt shall fail in the midst thereof, and I will destroy the counsel thereof; and they shall seek to the idols, and to the charmers, and to them that have familiar spirits, and to the wizards. And I will give the Egyptians over to the hand of a cruel lord; and a fierce king shall rule over them," v. 2—5. This confusion caused the deposition of Manetho, and the establishment of twelve princes as chiefs, till Psammetichus, one of

them, by the help of some Greeks, gained the sole command about 630 years before our era.

As the usurpation of Psammetichus had been attained by the aid of the mercenaries, whose numbers were increased by additions from Phœnicia and from Caria, who became regular settlers and citizens [1], the natives were dissatisfied, but more especially those of the military caste; and at length the greater part of the national troops, in spite of the endeavours of Psammetichus, abandoned their country, and, with their families, wandered into Ethiopia, where they established themselves.

Under the impulse given by the newly settled warriors, the Egyptian monarchs, who succeeded to the throne of Psammetichus, changed their policy, and, from being the defenders of their own dominions, became the assailants of the neighbouring states. Psammetichus himself attacked Syria, and after a long siege and many repulses captured at last the city of Azotus [2]. His successor, Necho, met with more rapid success at first. He took Jerusalem after a battle, in which the king Josiah fell [3], imposed on his successor a heavy

[1] Herodotus, book ii. cap. 152 and 154. Diod. i. c. 77.

[2] Herodotus, book ii. c. 157.

[3] 2 Kings, chap. xxiii. v. 29.; also Herodotus (book ii. c. 159.), who notices the capture of Jerusalem, to which he gives the name Cadytis.

tribute of a hundred talents of silver and one talent of gold, and extended his conquest over the whole of Syria, and even to the banks of the Euphrates.

At this time a new power, whose existence however was transient, had arisen in Babylon, out of the ruins of the Assyrian monarchy, and had reached its highest grandeur under Nebuchadnezzar. That king, at the head of his victorious troops, advanced to meet Necho. A tremendous battle was fought; the Egyptians were compelled to abandon their conquests, and were in their turn invaded by the Babylonian armies[1]. The erection of a naval power in Egypt was the consequence of the loss of this battle. Necho built ships on the Red Sea and on the shores of the Mediterranean, and sought to enable both to join in repelling invasion, and for that purpose undertook to construct a canal from one sea to the other. This project did not succeed at that time, though it was afterwards executed by the Persians under Darius. Nebuchadnezzar overran and plundered Egypt; but on his return to his kingdom, a revolt once more established the throne of that country under Apries, who, with his Mediterranean fleet, invaded Phœnicia, and captured Sidon. [2]Apries

[1] The description of this battle is most poetically given by the prophet Jeremiah, chap. xlvi.

[2] Herodotus, book ii. c. 161.

was succeeded by Amasis, who was raised to power in the course of a civil war, in which the native Egyptians subdued the mercenary troops, among whom Apries fell[1]. Amasis preferred peace to conquest, and died just before the attack of Cambyses, by which Egypt[2] at length fell under the dominion of the Persians, who had previously subdued the Babylonian kingdom. The Persians retained the sovereignty in Egypt till the conquest of it by the Macedonians under Alexander the Great, about the year 330 before Christ. Nearly a hundred and fifty years later, Egypt, with the greater part of the other conquests of Alexander, became a province of the all-conquering Roman republic.

After this digressive historical sketch of the causes of the abandonment of those fertile sources of metallic wealth in Nubia and Ethiopia, which furnished a large share of the gold and silver accumulated before the Christian era, and which must have taken place in a great degree before the time of Alexander, we may advert to the progress of the arts of mining, and of preparing the metals.

It is sufficiently obvious, from scattered fragments in the writings of the ancients, that in remote periods only that ore which was found

[1] Herodotus, book ii. c. 169.

[2] About the year 530 B. C.

on or near the surface was attempted to be separated into the two parts of metal and scoriæ. At first, sharpened flint-stones were used for excavating; and till harder tools could be found, the search for ore must have been a most laborious employment; for what was found on the surface in a pure state would be soon expended. An improvement in the tools commenced as early as the art of giving hardness to copper, by mixing with it some other metal, had been discovered. The hammers and chisels found in Nubia in the time of Agatharchidas were of this hardened copper [1]. In the course of time iron was discovered, and found to be the most applicable to the purpose of the miners. As early as the time of Moses, the Egyptians were not only acquainted with iron stone, but knew how to separate the metal and apply it to the various purposes of mankind [2]. Its discovery is carried back by the heathens to the fabulous ages, when their gods were supposed to have lived with and to have instructed mortals. Agatharchidas attributes to Vulcan the instruction of the Egyptians in the art of working the metals [3]. By whatever

[1] Agatharchidas, apud Photium, p. 1341.

[2] The chief passages which give information respecting iron, in the early parts of the Old Testament, are, Job, xx. 34, xxviii. 2, and xli. 27; Leviticus, xxvi. 19; Deuteronomy, xxviii. 23 and 48.

[3] Agatharchidas, apud Photium, p. 1341.

process the importance of iron tools became known and the use of them adopted, the work performed was still slow and excessively laborious, till, at length, according to Diodorus [1], the aid of fire was introduced, which made the work through the rocks much less difficult. After being thus enabled to reach the ores, the workmen had still to contend with the obstacles of subterranean water, of unwholesome air, of the filling the pits and passages by the earth giving way, and the darkness of the mines. We know not what precautions were adopted against the evil arising from the air and water; but the roofs of the mines were supported by large pillars being left of the natural rock, and in some parts the loose stones were prevented from filling up the passage by masonry. At first the only light in the mines was obtained by burning chips of fir-wood; but at length lamps were invented, which are described by a later writer, Clemens Alexandrinus. Oil was burnt in them. Each man had one fixed on his forehead, which turned on a moveable axis, in the manner of our sea compasses. The galleries were entered not perpendicularly, but by the sides of the mountains; and the ore was brought out on the backs of the men, a practice which is attributed to the imperfect knowledge of mechanics in some de-

[1] Diod. book c.

gree, but more to the universal employment of slaves alone in the mines. With all their impediments, the mining of the Egyptians was carried to a great extent, but, as Diodorus asserts, was as laborious and as costly as it was extensive [1].

The separation of the metals from the substances with which they are combined in the veins must have slowly and gradually advanced with a rude people. At first ores found in the purest state would be alone made use of; but as they became scarce, other ores, of a description that before had been neglected, would present themselves, and necessity would lead to means of rendering them useful. The inhabitants of Nubia were undoubtedly self-taught miners and refiners; and though the steps that led to their practice are unknown at present, we cannot err in supposing them to be nearly the same as those of other nations in the same stage of civilization, among whom the progress has been traced with more accuracy. Thus the ancient Britons formed their establishments for purifying their ores in gullies, which were washed by rapid streams of water; and the Peruvians, by placing theirs in a fire produced from wood, coal, dung, and saline plants. The Egyptians seem, by indications still visible, to have chiefly availed themselves of the aid of fire in the first part of the process, and

[1] Diod. book iii. c. 105.

thus cleared the ores of a large portion of the foreign particles. After that, the ores were crushed or ground in mills preparatory to their smelting. The use of mills for grinding corn was known in Egypt at an early period, and the adaptation of them to the crushing of ores was a natural step. Corn had been at first rubbed to meal by mortars, then between stones, till by the next step mills were introduced, which had become common in Egypt in the time of Moses [1]. When the ore had been ground to a moderate degree of fineness, the metallic particles, being the heaviest, were separated from the earthy by washing them in a current of water, when the heavier would sink down and the lighter be carried away by the force of the stream [2].

After the preparation of the ores in this manner, the metallic parts were dried and cleansed. As there are no proofs that the Egyptians were acquainted with the art of quickening the ores, it is presumed that the smelting followed immediately. That operation was performed in crucibles or earthen pots, whose covers were luted on with some kind of cement. These vessels were then placed in the furnaces, and, probably by the help of bellows, a strong fire kept up during

[1] Exodus, cap. ii. v. 5. and Deuteronomy, cap. xxiv. v. 6.

[2] Geschichte des Bergbaues und Huttenwesens bey den alten Volkern. von I. F. Reitmeir.

five days. For separating and fining the gold, alloys were employed, consisting of lead, tin, salt, and barley bran[1]. By these applications, during five days' continuance, after cooling, a mass of clear and purified gold was obtained. The Egyptians are shown by the Mosaic history[2] to have been acquainted with the art of purifying gold. The Hebrew lawgiver was skilled in all the learning of the Egyptians; and as it is not related as a display of miraculous power, we may venture to presume that his grinding the golden calf to powder was effected by the application of some substances, perhaps of nitre, which abounded in Egypt, with the knowledge of which he had become acquainted in the course of the education he had received in the royal palace.

It is probable, though we have now no notices on the subject, that the Egyptians managed their silver ores in the smelting-houses in the same manner as the gold. After the conquest of Egypt by Cambyses, about 510 years before Christ, and whilst under the government of his lieutenant, Aryandes[3], a great improvement seems to have been made in the purification of silver; for that which was produced under that

[1] Diodor. iii. 14. Μιξαντες μολιβδου βωλον, ἁλων, κασσιτερου βραχυ, και κριθινον πιτυρον.

[2] Exodus, cap. xxv. v. 31—36, and cap. xxxii. v. 4.

[3] Herodot. Pollux, iii. s. 87.

vicegerent was celebrated through the world for its purity and fineness, and was commonly known by his name, even after his unjust execution. At a later period, according to Pliny [1], a mixture of the brass of Cyprus combined with sulphur was applied to silver, by which that metal was greatly adulterated in Egypt.

It is not possible now to ascertain what was the amount of the gold and silver which the mines of Egypt afforded. Without giving full credit to the relations of Diodorus, it would be improper to omit all notice of them. In his description of the city of Thebes, he says [2], "The fabric of the ancient temple has continued to our time, but the silver and the gold, with the ornaments of ivory and precious stones, were carried away by the Persians when Cambyses burnt the temples of Egypt. The palaces of Persepolis and Susa, and others in Media, were built with those treasures by workmen sent from Egypt for that purpose. It is reported that the riches of those palaces were then so great, that in the rubbish and cinders there were found and gathered up three hundred talents of gold, and no less than two thousand three hundred talents of silver." In his description of the palace of the ancient Egyptian monarchs, he says [3], "Near to

[1] Pliny, xxxv. 9.
[2] Diodorus, book i. cap. 4.
[3] Idem, book iv.

the gallery is an apartment in which is represented the king himself, curiously carved and painted in glorious colours, offering to the gods gold and silver as much as he received yearly out of the gold and silver mines. The sum was inscribed there, and amounted to thirty-two millions of minas, according to the rate of silver." If the mina here stated means a weight of the same value as the Attic mina, viz., £3. 2*s*. 6*d*., the annual product of the mines must have amounted to the enormous sum of nearly six millions sterling.

Whether this exaggeration is to be ascribed to the vanity of the Egyptian monarch who caused the inscription to be made, or to the credulity which is too obvious to mislead in many parts of the works of Diodorus, who visited Egypt fifty years before Christ, there can be no doubt but the produce of the mines of that country, and of the others whose gold and silver were deposited there, far exceeded the quantity which was drawn from all the mines of the then known world in subsequent ages, down to the discovery of America.

This view of the great produce of the African mines is strengthened by other considerations, such as the numbers and the treatment of the persons who were employed in the mines of those countries. Diodorus informs his readers

that "[1] on the confines of Egypt and the neighbouring countries there are parts full of gold mines, from whence, with the cost and pains of many labourers, much gold is dug. The soil is naturally black, but in the body of the earth there are many veins, shining with white marble, and glittering with all sorts of bright metals, out of which those appointed to be overseers cause the gold to be dug by the labour of a vast multitude of people. For the kings of Egypt condemn to these mines not only notorious criminals, captives taken in war, persons falsely accused, and those with whom the king is offended, but also all their kindred and relations. These are sent to this work either as a punishment, or that the profit and gain of the king may be increased by their labours. There are thus infinite numbers thrust into these mines, all bound in fetters, kept at work night and day, and so strictly guarded that there is no possibility of their effecting an escape. They are guarded by mercenary soldiers of various barbarous nations, whose language is foreign to them and to each other, so that there are no means either of forming conspiracies or of corrupting those who are set to watch them: they are kept to incessant work by the nod of the

[1] Diodorus, book iii. cap. 1., from Agatharchidas de Rubro Mari.

overseer, who, besides, lashes them severely. Not the least care is taken of the bodies of these poor creatures; they have not a rag to cover their nakedness; and whoever sees them must compassionate their melancholy and deplorable condition, for though they may be sick, or maimed, or lame, no rest nor any intermission of labour is allowed them. Neither the weakness of old age nor the infirmities of females excuse any from that work to which all are driven by blows and cudgels, till at length, borne down by the intolerable weight of their misery, many fall dead in the midst of their insufferable labours. Thus these miserable creatures, being destitute of all hope, expect their future days to be worse than the present, and long for death as more desirable than life." The concluding remark of our author on the whole subject of these mines may be worth inserting: "Nature teaches us that gold is obtained by labour and toil, is retained with difficulty, creates every where the greatest anxiety, and in its use produces both pleasure and grief."

Another writer gives a description of the working of mines, which, though relating to Samos, may be very obviously applied to those of Egypt and Nubia. "Those who dig in the mines cannot stand upright at their work, but are obliged to lie down either on their back or

on their sides; for the vein of the earth they dig runs lengthwise, and is only of the depth of two feet, though considerably more in breadth, and it is enclosed on every side with hard stones, from which the ore is drawn forth[1]."

Southern Africa.

Having thus taken a view of the state of mining and the productions of the mines in Egypt and Nubia, we may have recourse to the intimations of ancient authors respecting the precious metals extracted from the interior of the more southern parts of eastern Africa.—Their representations of the barbarous state of society in which the inhabitants of those countries lived lead to the conclusion, that they had not sufficient intelligence or industry to excavate the earth, and separate the metals from the ores, and that, therefore, the gold they procured was obtained, as in the present day, from the streams that descended from the lofty mountains.

Among these tribes, one is especially noticed by Herodotus. When Cambyses had overrun Egypt, he wished to extend his influence still farther by means of negotiations with the people of the south. Among[2] these, the Macrobians

[1] Theophrastus de Lapidibus, cap. cxix.

[2] Herodot. book iii. cap. 20—26.

appeared the most desirable to be conciliated; and some ambassadors were sent to them from among the Ichthyophagi, an intervening people, who were acquainted with their language. The negotiations are related minutely, but seem to have terminated unsuccessfully; as the presents Cambyses sent were rejected with disdain, and a kind of defiance was returned to the conqueror of Egypt, by sending a bow which none but the Macrobians had sufficient strength to bend, and a recommendation to him to be thankful to the gods that the Ethiopians had not been inspired with the same ambitious views of extending their dominions as himself. These Macrobians are celebrated by Herodotus on account of their stature, their strength, and their longevity, and are probably "the Ethiopians, men of stature," mentioned in the Sacred Writings. The warlike expedition of Cambyses was as unsuccessful as his attempt at negotiation. Cosmas, a Greek writer, who certainly visited Ethiopia, and probably India, about the year 535 A.D., has given an account of the trade carried on with the Macrobians in his day[1]:—

"The country which produces incense is at the farther end of Ethiopia, fifty days' journey from Axum, not far from the ocean, though not

[1] The best edition of the Topographia Christiana of Cosmas is in Montfaucon, Coll. Nova Patrum, tom. ii. p. 113, &c.

quite close to it[1]. The people of Barbaria, in the neighbouring country of Sasu, fetch the incense and other valuable spices, which they convey by water to India and to Arabia. The country of Sasu is very rich in gold mines, and the kings of Axum[2] send people there every year for the sake of the trade in gold. Others who are merchants join them, and thus a caravan is formed of more than 500 persons. They carry with them oxen, and salt, and iron. As soon as they reach the boundary they fix on an encampment, which they surround with a thorn hedge[3]. Within this enclosure the cattle are slaughtered and cut up, and the pieces of meat, as well as the salt and the iron, are laid upon the fence. The people of the country come and place on the wares one or more pieces of gold, and wait outside till the bargain is concluded. The owners of the wares, if they are satisfied, take the gold, and the others their articles. If the gold is not thought sufficient, those without either add more to it or take away what they have offered. This traffic is generally continued during five days, or till the whole of the wares

[1] This is probably the country noticed in Salt's map of Abyssinia as the land of the Somaulis.

[2] Axum was at that period the capital of Abyssinia.

[3] We may conclude these were the kantuffa-trees, noticed by Salt and by Bruce, which seem peculiarly appropriate for the purpose of such fortification.

which are brought have been exchanged, and is conducted in the manner here described because they have no interpreters, and do not understand the language of each other."

The same mode of conducting trade was adopted by the western Moors, who exchanged goods with some of the barbarous nations on the banks of the Niger, as described by Shaw[1] and confirmed by Wadstrom[2], as well as by Commodore Stewart in his account of his embassy to Mequinez in 1721.

We certainly can form no idea respecting the quantity of gold which these Macrobians furnished to commerce. The fact of their yielding it even as early as the time of Cambyses, 500 years B. C., is sufficiently proved by the contempt which they manifested at the insignificant present of gold chains which the nation of the Ichthyophagi, who acted the part of ambassadors on behalf of the Persian monarch, brought to them from him.

This tribe was only one among many in the southern part of Africa who obtained gold from the rapid streams, and conveyed it by ways of which we can only form conjecture from knowing somewhat of the present practice of those people. There can be no doubt, however, that

[1] Shaw's Travels, p. 239.
[2] Wadstrom's Colonization, p. 24.

whatever was collected was chiefly conveyed to Nubia and Egypt, where a great part of it remained till advantageous occasions offered of exchanging it for the tempting productions of Phœnicia and Carthage on one side, and for those of India and Arabia on the other. Both sacred and profane writers unite in their testimony of the riches which were collected at a remote period on the eastern part of Africa.—Ezekiel [1], when speaking of the commerce of Tyre, enumerates the places in Africa which supplied the Phœnician marts, and names the commodities and the districts from whence they came, in a way which shows they were in his days familiar to the Hebrew people.

As soon as the Greeks obtained some knowledge of the wealth of those countries, they seem to have been wonderfully impressed with the immense riches they contained. Agatharchidas [2], who wrote about 170 years before our era, says, "The Sabæans excel not only the neighbouring barbarians, but all other people, in their wealth and splendour, for they receive a higher price for the same quantity of their wares than any other traders. As their remote situation protects them from the plunder of enemies, they have heaped together immense masses of the

[1] Ezekiel, cap. xxvii. v. 21—24.

[2] Agatharchidas de Rubro Mari, p. 65, in Geogr. Min. Hudo, vol. i.

precious metals, and especially in their chief city. Exquisite gold and silver articles of every form, drinking vessels of pure gold, seats and tripods with silver feet, and especially valuable ornaments in abundance, are to be seen there. The columns and the colonnades are rich in gold, and have capitals ornamented with silver carved work. The fronts and doors of the houses are decorated with golden ornaments, in which precious stones are set. Thus their houses are made splendid with silver, gold, precious stones, and ivory, and with whatever is most costly. The people have enjoyed this good fortune from primeval time, because they have been sufficiently distant from such as are prompted by avarice to enrich themselves at the expense of others."

Europe, comprehending also the colonies of Greece in western Asia.

Whilst the sources of gold and silver in Egypt had been either stopped or suspended by the foreign invasions or the domestic hostilities to which that country had been exposed, the Greeks and their colonists began to produce those and the other metals, though in much smaller portions. The inhabitants of Europe continued in the savage state some ages after the people of eastern Asia and of Egypt had made considerable progress in civilized life.—Those of the south-east parts of Europe being nearer to the more civilized countries of Egypt and Asia, and receiving from them some refugees who brought the arts and discoveries of

their own countries with them, were naturally the first to imbibe the improvements of more advanced stages of society. From that distant time, about fifteen centuries before our christian era, or perhaps six centuries before the time of Homer, the knowledge of metals in Europe commenced. It is possible that even at earlier periods some might have been found on or near the surface, but it is highly improbable that in that untaught state of society any mines had been explored.

The Phœnicians, who gave to Europeans the first impulse towards social life, were also the first introducers of the practice of mining. Accordingly we learn from Strabo[1], that Cadmus, a Phœnician, one of the emigrants who arrived in Greece, opened the first mine of copper and gold in the mountain Pangæus in Thrace, though Herodotus[2] speaks of those mountains as containing mines of silver and gold[3]. It is not, however, improbable that the activity of the Phœnicians may have set to work some of the mines in the islands of the Mediterranean Sea, and perhaps in the remote country of Spain, before the arrival of Cadmus. The thirst for

[1] Strabo, xiv. p. 998.

[2] Herodot. book vii. c. 12.

[3] The arrival of Cadmus in Greece is estimated by the Abbé Barthelemy, in Anacharsis, to have occurred in the year 1594 before Christ, but by others 1493 before that era.

gain, by which that people were distinguished, may have led to the discovery of the European ores, without its producing any benefit to the natives of Europe, who were robbed of their metallic treasures before they were acquainted with their value; for they were equally ignorant of the modes of extracting them from the earth, and of purifying them from their grosser particles. If the Phœnicians were the first who carried on mining operations in Europe, they were by no means the universal teachers of that art. In most cases, other refugees, who came from the more eastern parts of Asia, were the first instructors of the Europeans, and the first explorers of their mines.

The most civilized of the people of Europe were found in the early ages along the shores of the Mediterranean sea; and it is among them we discover the first steps in mining. The earliest of those tribes were the Greeks, whose progress in this branch of industry it will be proper in the first place to examine. Then followed the Romans; and after them, but at a great distance, both in time and in skill, those called by the two former people the barbarians, in the neighbourhood of the Danube.

The Greeks explored beneath the surface in various districts in their own country, as well as in their eastern and western colonial establishments. This searching for ore, when it had

The Greeks.

begun, was continued during a succession of centuries; but the progressive improvements introduced were not so much the effect of any foreign teaching, as the result of their diligent and energetic investigations of the best systems of operating.

It is impossible, whilst looking at this subject, not to lament the loss of the works of Theophrastus, who besides the treatise De Lapidibus, which has come down to us, is said to have written many other valuable works, especially on minerals, about 300 years before the christian era; scattered fragments of which are to be found in the writings of those who succeeded him during the following three or four centuries. It is to these extracts and to other passages also incidentally inserted in works on subjects of a different nature, that we must have our chief recourse in our inquiries into the mining progress of the Greeks, though traces of the existence of the art may be found in Homer and other authors of a date anterior to Theophrastus.

Although the chief object in this inquiry is into the production of the precious metals, yet it is scarcely possible to separate wholly the progress made in raising and purifying them from that of the discovery and application of the metals of inferior value. They are so mingled together in the writings of the early ages, and the operations in them were conducted in a

manner so similar, that the introduction of casual remarks on them can scarcely be deemed a useless or a wholly uninstructive deviation from our chief purpose.

It may be convenient to divide the account of the Grecian mining into three distinct periods. In the first of them, the chief mines were in the islands of the Mediterranean sea, and the operations in them were carried on principally by Phœnician workmen. In the second period, the mines were discovered and worked in the Grecian continental territory, and chiefly in Attica. In the last term, new and productive mines were worked in the dominions of Philip, king of Macedon, which ultimately, with the mines of the other Greeks, fell into the hands of the Roman republic.

In the first period, the writings of Homer are our chief and almost exclusive guides. His works, after making due allowance for poetic exaggeration, give, however, but little information as to the first discovery of metals, or of the use of them at the time he wrote. When Helias, or the sun, is represented as the discoverer of gold, and Ericthonius as that of silver, we are justified, without giving credit to the tales, in ascribing to these metals a very high antiquity. The same is the case with copper, the knowledge of which, according to tradition, was communicated immediately by their gods. The discovery

of iron was probably of a later date, and is described in a variety of ways[1]. If the Oxford marbles be authentic evidence, it was known about the year 1431 before Christ.

Tin was furnished to the Greeks by the Phœnician traders, and it is probable they were supplied with lead from the same source. There is no passage in Homer from which it can be inferred that at the period in question the Greeks on the continent of Europe worked many mines, though perhaps some of the precious metals may have been found upon the surface, or so near it as to be easily made useful. On the other hand, on the islands the mines were numerous, if not highly productive. In Crete and in Thasus mines were explored, which had been opened by the Phœnicians before those islands fell to the Greek possession. Those in Crete were of iron, but in Thasus they are represented as productive in gold[2]. "From their gold mines of Scaptesyle," says Herodotus, "they obtained on an average eighty talents. Thasus itself did not produce so much, but they were so affluent, that, being generally exempt from taxation, the whole of their annual revenue was two hundred[3], and

[1] Causaubon in Rerum inventarum Onomastico, a. Ferrum.

[2] Herodotus, book vi. c. 46, 47.

[3] This revenue appears by a passage in Thucydides, lib. i. cap. 100, to have been derived from the lands as well as the mines, which reconciles an apparent contradiction in the text of Herodotus.

in times of great abundance three hundred, talents. These mines I have myself seen; the most valuable are those discovered by the Phœnicians, who, under the conduct of Thasus, first made a settlement in this island, and named it after their leader."

Eubœa produced the best of iron and copper, but the mines of both metals had been exhausted in the time of Strabo. The island of Cyprus yielded gold, silver, and copper, and the mines continued to be worked even till the times of the Romans, though no traces of them were to be found when that island was explored by later travellers[1]. The copper was so fine that the Romans used it for their coin, and for the higher class of domestic utensils. Siphanto, the ancient Siphnos, contained extensive mines of gold and silver, whose antiquity may be inferred, because a tenth of the produce was annually sent as a present to the temple of Delphi. When at a later period this tribute to the image of Apollo at that place was withheld, the exhaustion of the mines, which probably arose from their excessive working, was attributed by superstition to the anger of the offended deity[2]. Tournefort examined these mines about the year 1690 or 1700, and found the entrances, but could not

[1] Mariti Viaggi, t. i. p. 22, and Meursius de Cypro, lib. ii. c. 2.

[2] Pausanias, book x. cap. 11.

explore them satisfactorily. The same traveller remarked on the island ores of lead resembling tin, which the rain had discovered to view, but which were not dug up, because the inhabitants felt a disinclination to work in mines[1]. The same author found on the island of Milo, which in former times, under the name of Melos, had been celebrated for its alum and sulphur, the latter substance, and also iron, which was taken out of the millstone quarries[2]. The division of the island in which the iron is found bears from it the name Σιδηροιωννης.

In all probability the mines here noticed, or at least a great part of them, were worked at an earlier period than those in the western islands, in the vicinity of Italy, although some of the latter must have been in operation in a remote age; for the Greeks in the time of Homer obtained copper[3] from Temesa, an island near Upper Italy. Some, from other parts of that poet's works, have been led to the opinion that the Temesa he mentions was a city in the island of Cyprus. In the time of Strabo, however, the mines on the Italian island of the same name are spoken of as having been formerly productive of that metal. The island Pithecusa, oppo-

[1] Tournefort, Voyage au Levant, t. i. p. 67.

[2] Idem, t. i. p. 100.

[3] "—— where I go to purchase copper." Odyss. book i. verse 184.

site the city of Cuma, was at one time rich in gold, and continued to yield some when the Neapolitans took possession of it and of Cuma. Sicily and the Lipari Islands were celebrated in antiquity for the brass they afforded.

In all probability the reigning princes in the several islands were the chief, if not the exclusive, possessors of the mines which have been mentioned. In conformity to the state of society in those ages, the operations of mining and smelting could not have been easily performed by any other hands than those of their slaves, whose numbers were the scale by which the wealth of the several chiefs was estimated. The whole work must have been simply and unscientifically conducted, and if we were fully acquainted with it would probably exhibit nothing very remarkable.

We come now to the second period, in which the operations of the Greeks in mining are much better known to us than in that we have been occupied in examining; as we find abundant notices of the proceedings on the continent of ancient Greece. In the Peloponnesus, the Lacedæmonians, from their political principles and institutions, showed such indifference to the acquisition of the precious metals, that no extensive mining operations are to be expected among them. The Athenians, however, zealously pursued such operations, as well in the

rich silver mines of Attica, as in the productive gold mines in their foreign possessions, in Thrace, and in the island of Thasus. Thessaly produced ores that were rich in gold, whilst Bœotia furnished iron from its mines. Epirus also had silver mines, which were continued to be worked in the time of Strabo.

The whole of these mines make their appearance either a little before or soon after the Persian war; for shortly before the victory of the Greeks over the Persians, gold and silver were much more scarce among the former than they could have been if the rich mines of both those metals had been diligently laboured before that time. According to the report of Xenophon[1], the Athenians worked the silver mines of their own country from an unknown distant age; but it appears probable that for a long time the only ore that was used was that found near the surface, and that the imperfect application of labour even to that met with frequent interruptions. Capital and scientific knowledge were on much too low a scale to admit of decided perseverance in mining pursuits.

A classification, by which Solon had arranged the citizens according to their incomes a short time before the Persian war, shows how very small was the amount of wealth then in exist-

[1] Xenophon de Redit.

ence. Yet at that time the mining in Attica makes some figure; and at the beginning of the war the income of the state, derived from the mines, amounted to about £8,000 sterling. That income, in a subsequent period, appears to have risen higher, from the facilities afforded by an increased capital, and from greater ardour in the several undertakings. The augmentation of riches from the mines, with the wealth of the citizens, acquired by their industry, and the additional aid afforded by the rich gold mines of Thrace, and of the silver mines in the island of Thasus, all conspired, after the foreign acquisitions obtained by conquest, to raise the state of Athens to the splendour and fame which it ultimately reached. The various streams continued to flow copiously till the war of the Athenians with their rivals and enemies in the Peloponnesus broke out; a war which put an end to the power of the republic, and presented many impediments to all mining operations.

Although the state was in some measure again elevated in the succeeding years, yet the mines were too much depressed to be restored to their former condition. Xenophon's encouragement[1] to their restoration was more patriotic than successful; for, besides the injury to the property of the citizens, which ensued from the impulse he

[1] Xenophon de Redit.

gave, the complete exhaustion of the mines soon became manifest, and put to shame that prophetic spirit by which he had predicted the most brilliant success. The injurious effects of the stoppage of the mines in Attica, with the contemporaneous loss of the foreign gold mines, were seen in the contrast between the former prosperity of the state, and the depressing poverty which followed speedily afterwards [1].

The manner of working the mines in the small and democratic state of Athens, may be presumed to have been different from that which was pursued under the despotic monarchs of Egypt; and that presumption is confirmed by many passages in the writings of the Grecians. The mines appear always to have been the property of the community, although they were not at all periods worked by the state. Before the Persian war, an annual division of the profits was made among all the citizens; which shows, that they were either worked by the state or let out to farm. After that important war, in consequence of the suggestion of Themistocles, the distribution of the produce ceased; though the profit was collected and employed by the government for public purposes. From that period it becomes clearer that the mines were chiefly worked by private

[1] Meursii Fortuna Attica, p. 56.

individuals or by companies. It seems very probable that the state had some ancient mines which were let to farm, whilst some of the others had been originally opened by private individuals, with the consent of the community, who had farmed them, and, instead of a fixed rent, received a twenty-fourth part of the proceeds[1]. By such and other regulations the object of increasing the mineral treasures of the state was attained, and in process of time the whole of the operations in the mines were carried on by private persons.

The numbers who possessed mines at the period in which those operations were most extended were very considerable, and even in the time of Demosthenes, though a decline had taken place in that branch of industry, they appear to have been numerous; for that orator classes the miners in equal ranks with the agriculturists and the merchants[2]. These persons do not, however, appear to be all actual miners; but individuals, who by their capitals were enabled to commence and prosecute such undertakings, were included in their number. The profit of the mines flowed into a variety of channels, because, as the farmers of them carried on the works by means of slaves hired from the

[1] Xenophon de Redit.

[2] Demosth. adv. Aristocratem, t. ii. p. 309. edit. Taylor.

slave owners, much of the advantage gained must have passed into their hands. Whole families, consisting of hundreds of individuals, were hired for these purposes, and worked under the supervision of others, who were possessed of knowledge and experience in mining operations, but who were, notwithstanding, in like manner hired slaves. In some cases these overseers, though slaves, were the farmers of the mines; for it was not unusual in Athens for the proprietors of manufactories, of workshops, and of cultivated land, to farm them out to their own slaves, or to the slaves of other owners.

The common condition of such letting was, that the overseer who hired the property with the slaves was to pay daily a given sum for each; and this condition seems to have been the same, whether the object let to farm was of an agricultural, a manufacturing, or a mining nature. The general rate of payment for slaves in the mines was an obolus a day, or, in our money, about three shillings a month; besides providing them with food and clothing. The farmer also was bound to replace such slaves as made their escape, and always to keep up the number originally let to him. In order to prevent their running away, the slaves were constantly kept in companies and under rigid inspection. No work beyond what fear induced them to perform was to be expected from la-

bourers under such circumstances. The operators in mining, whether proprietors or renters, were thus compelled to keep vast bodies of slaves, whose united numbers amounted to many thousands, or, according to Athenæus, to myriads. These great numbers of people, excited by the oppression under which they lived, frequently broke out into such insurrections as were found highly dangerous to the republic. History relates some of these insurrections, and especially one, when the slaves in Attica took possession of Cape Sunium, and from thence carried on for a long time most desolating excursions through the territory of the Athenians [1].

We are ignorant of what laws or measures were established to suppress these insurrections, nor is it clear that any regulations were framed to restrict the numbers of slaves in the several mines; but we know that the government exercised some superintendnece over them, and that certain laws prescribed the places where the workings were to begin, the directions they should take, and the extent to which they should be carried; for all of which purposes a chief director was appointed by the state [2].

[1] Athenæus, vi. p. 272. edit. Reiske.

[2] It would have been easy to have translated from the learned work of Professor Bœckh, or easier to have transcribed from the admirable translation of it under the title of the

The third period of Grecian mining may be noticed without extending the subject to any great length. Philip of Macedon, the father of Alexander, concluded an alliance with the Olynthians, and proceeded to possess himself of the gold mines of Thrace, which had been worked from a distant period by some emigrants from Thasus.

By the attention he turned to the improvement of those mines, he appears to have succeeded in rendering them far more productive than before. The expense incurred in the course of his improvements appears to be chiefly that arising from the great influx of water, as the shafts were continued to a greater depth. From the general ignorance in mechanics, this water could only be removed by the employment of a much greater number of men than had previously been occupied in that part of the labour. By perseverance, however, Philip was enabled to increase the produce of the mines; but it is doubtful if the actual net proceeds were equal to or at least exceeded what had been expended in acquiring them.

" Public Economy of Athens," more accounts of the mines of Laurion in Attica than have been here communicated. It would, however, have extended this branch of the subject beyond its due proportion, and if it prevented any inquirer from a reference to that valuable work, it would have been depriving him of a high gratification.

We learn from Diodorus[1], that Philip having conquered Crenides on the confines of Thrace (about 358 years before Christ), enlarged it, and called it after his name Philippi; a place afterwards remarkable for the battle of Brutus and Cassius. The gold mines in that neighbourhood had been so ill explored, that they produced but little, till at length by his improvements they yielded yearly one thousand talents.

With the treasure thus obtained from his Thracian mines Philip was enabled to bribe Demades, and the other orators of his party, to obtain the preponderance in Athens, and finally to subdue the other Grecian states; and thus lay the foundation of that force by which his son and successor Alexander was at length sufficiently powerful to become the master of the eastern world.

We have no accounts of these Grecian mines during the succeeding two centuries, at the end of which they, with most of the other mines of the known world, were transferred to the power of the Roman republic.

The Greeks, at least in the latter period of their mining, must have made a progress beyond the practices of the Egyptians. The ores seem to have been sifted after they had been pounded

[1] Diodorus, book xvi. cap. 8.

in the mortars; for a passage in Pollux[1] expressly notices the sieve (σαλαξ) among the tools of the miners. Neither the form of the furnaces nor of the bellows is described; but the latter is noticed by Theophrastus[2], and represented as of small size. Charcoal was introduced; the traders in it being mentioned by the same author[3].

The gold was melted by a gentle fire, with the addition of a mixture of salt, nitre, and alum (στυπτηρια), by which substances the silver also was purified[4]. It is not improbable that lead was also added, to promote the flux of the metals. The Colophonians were the most celebrated among the Greeks for their skill in smelting gold: but none of them were equally skilful in purifying silver; for the work was so imperfectly performed, as we learn from Strabo[5], that their successors were enabled to separate the silver from the earths with a profit; although even they were far inferior to the operators on metals in more modern times. Though the Greeks were acquainted with quicksilver, and had much cinnabar, which they used as paint, they were ignorant of its property, or of its application to the purpose of quickening the pro-

[1] Pollux, x. s. 149.
[2] Theoph. de Lapid. p. 393.
[3] Idem.
[4] Hippocrates de Diæta, p 193.
[5] Strabo, ix. p. 613.

cess of separating the precious metals from the substances with which they were mostly found. It is not extraordinary that the value of quicksilver should not be early known to the miners; for Callias [1], one of the most extensive workers of silver mines in Attica, found cinnabar in his ore, without knowing its value, as the Peruvians sought for silver in the mine of Guancavelica [2] long before they discovered the mercury or cinnabar. The gold and silver obtained by mining among the Greeks have alone been hitherto noticed; but of the former metal some must have been procured by washing from the sands of the more rapid torrents that descended from the mountains. From the nature of this employment—from the insulated and small bodies by which it is carried on—from the facility with which the smallest portions of its produce may be disposed of—and from the privacy which in times of turbulence its possession requires—we cannot expect to find in ancient history, or even in ancient poetry, many relations on this branch of the subject. Herodotus [3] describes the river Pactolus running by Sardis, "which, in its descent from the mountain Tmolus, brings down a quantity of gold dust." The fable of Midas, who, by washing in that river, had acquired the power of

[1] Pliny, xxxiii. 7., and Theophrastus de Lapid. p. 400.
[2] Schneider Zusätzen zu Ulloa, part ii. sec. 241.
[3] Herodot. book v c 101.

converting into gold whatever he touched, is well known. Like most other streams whose sands yield gold, it became exhausted of its treasures; for in the time of Strabo, according to that author, it yielded none[1].

There were other mines in Asia either in operation at the time when Strabo wrote his extensive work, or that had been productive in former periods, which merit some notice.

"In Armenia," he says[2], "in the province of Hisperatis, near Cambale, mines of gold were found, which induced Alexander to send Memnon there with his forces; but they were all cut off by the inhabitants of the country. We may judge of the power of the kingdom of Armenia, by seeing that Pompey required of Tigranes, the father of Artavasdes (95 years B. C.), six thousand talents of silver, which he instantly distributed among the Roman troops; each soldier receiving one hundred and fifty drachmas, each centurion one thousand, and each eparch[3] or chiliarch one talent." It appears by a subsequent passage in the same chapter, that this large sum was to be paid by fourteen annual instalments, during which the revenues of Syria, and of several other

[1] Strabo, book xviii. [2] Strabo, book xi. cap. 19.

[3] The French editors of Strabo suggest that this name designates the commanders of the legionary cavalry, though confessing that in this they differ from all the manuscripts existing in the present day.

provinces, were to be allowed to Tigranes to enable him to pay the contribution.

"In Chaldea or Chalybes," Strabo says, "there must have been mines of silver formerly, although there are none at present; but the country is now only renowned for its iron. Homer notices those of silver, and he was likely to be as well acquainted with them as with the mines of brass at Temesa in Italy, or with the vast riches at Thebes in Egypt, which were at twice the distance[1]."

The same author informs us that, "in the Troad, beyond the territory of Abydos, the city of Astyra once stood; the land of which now belongs to Abydos, though in ancient times it was governed by its own laws. It had mines of gold, which yield little or none at present, having been exhausted, like those of mount Tmolus, near the Pactolus[2]."

A more diligent research among the writings of antiquity would doubtless bring to our knowledge some mines which were formerly productive of the precious metals in a greater or less degree, but which have been closed, from the exhaustion of their treasures; and the number might probably be much increased, if the nume-

[1] Strabo, book xii. cap. 2.
[2] Idem, book xiii. cap. 1.

rous authorities from which Herodotus, Diodorus, Strabo, and Pliny derived their information were now accessible to our inquiries.

It seems, however, highly probable, that the greater portion of the gold which had been collected by the Greeks in the most remote ages had been acquired by washing the sands. It was the most natural and the only easy manner in which the rude inhabitants could obtain it; and though the quantity procured by the whole number that worked at it may have been very small, yet the chance of great success must have been seductive to many in the savage state; as it has been remarked that in that stage of society there is always a strong propensity to all games of hazard. The far greater part, however collected, would be carefully preserved and transmitted to posterity; and though the product of each year might appear insignificant, yet in the course of many successive centuries, when all was ultimately collected on one point, as in a focus, at Rome, it renders the account of the vast metallic wealth in that seat of empire by no means improbable.

Italy. It is remarked by Pliny, "that Italy yields to no country in abundance of mines of all the several kinds of metals; but it is forbidden to dig any of them by an ancient law of the senate, which expressly commands that the mines of

Italy shall be spared[1]." Long before the power of the Roman senate was extended over the whole of Italy, some of the nations which inhabited that peninsula had not only explored mines, but had made such progress in the mechanic arts, and in works of taste and utility, that they may in fact be looked upon as the masters and instructors of the Romans.

The Etrurians had certainly made some advances in the arts before Rome was founded. Whatever may have been their origin, it seems clear that they had gone before the other nations that then inhabited Italy. The Etrurians had brought painting and design, with some other arts, to great perfection, earlier than the time of Romulus; and the colours and figures on many of their vases are highly valued, even in the present age, and have preserved their original freshness and distinctness. These arts had been introduced from Greece by an accidental circumstance; for we learn that "a certain Corinthian named Demaratus, of the family of the Bacchiadæ, being engaged in commerce, sailed to Italy with a vessel and cargo of his own, and had returned with great wealth; but a sedition having broken out at Corinth, and his family, which had been of the oligarchy, being oppressed, Demaratus did not deem himself in security under

[1] Pliny, book iii. cap. 6.

the new government. He therefore embarked with all his property for Etruria, where, by his great wealth, he acquired the government of the city; and, having married a woman of the country, had a son, who, at length, under the name of Lucius Tarquinius Priscus, became the king of Rome[1]."

The Etrurians, by their knowledge in mining, first obtained copper, and afterwards iron. When the boundaries of their city were marked out, it was done with a ploughshare of copper or bronze[2]; and it was the custom of the priests to have their hair cut with knives, or perhaps razors, made of copper[3]; though it does not appear that, like some other of the ancient tribes, they had acquired the art of hardening it by a mixture of tin.

After the discovery and the working of the copper mines on the continent, the Etrurians explored mines of iron in the island of Elba, then a part of their dominions, by which operation they are said to have gained very great profits. It is not known that these people produced either silver or gold, but they supplied Rome with the copper from which was coined all the money which circulated in Rome through several succeeding centuries.

[1] Dionys. Halicarn. Antiquit. Rom. lib. iii. sect. 46.
[2] Macrob. Saturn. v. 19. [3] Idem.

In Upper Italy, the Salassi, a people who inhabited what is now the province of Aosta in Piedmont[1], produced iron, gold, and other metals. Their gold was very pure. It was collected by washing the sands of the river Po, whose streams were divided into various branches; and, after that tribe was conquered by the Romans, the several rivulets were let at a yearly rent by the imperial farmer-general of the finances. The valleys still produce much copper and iron, but no gold has been yielded by them since their total subjugation to the Roman power under Augustus.

The conqueror sold the inhabitants, to the number of thirty-six thousand, as slaves, excepting only nine thousand capable of bearing arms, who probably served to augment the forces of the victor.

The country round Aquileia, and the whole district of the Noric Alps (now Illyria), was rich in gold, which was found partly in large grains on the surface, and partly in mines so pure, that an eighth part only was lost in the processes of smelting and refining. At one period, this gold was laboured so extensively, that its great quantity caused a decrease of one third in the price through all Italy, and induced the proprietors to employ fewer workmen in order to raise the

[1] Piemonte diviso in quattre dipartimente. Milan, 1802.

value[1]. The mines there were also celebrated for the quality of their iron. It was used for making the best weapons, and hence, "Noricus ensis," among the Romans, was as much synonymous for a good sword as a Toledo or Andrea Ferrara blade in other times. In this sense it is used by Horace, book i. ode xvi. v. 9. Gaul was scarcely productive of metallic wealth before the reign of Augustus. The Tarbelli, a people at the foot of the Pyrenees, are noticed by Strabo[2], as working mines of gold, silver, brass, and iron. The gold was found near the surface, and in so pure a state as scarcely to require smelting. Some of it was also procured by washing the sand of the rivers, but was less pure. The other metals were found in their respective ores.

There seems no reason to believe that the mines in Hungary were worked at any period before the christian era[3]. The earliest accounts of them do not go higher than the years between 745 and 770 from the birth of Christ, except an assertion of Agricola, a German physician of great celebrity for his knowledge of metals, who wrote about 1550, and says, the mines of Kremnitz

[1] Strabo, iv. cap. 6.

[2] Idem, book iv. p. 290.; also Cæsar de Bello Gallico, iii. 21.

[3] Ferber uber die Gebirge und Bergwerke in Ungarn. Berlin, 1781.

and Chemnitz had been worked near one thousand years.

If the mines of Sweden and of Norway yielded any silver or gold at that remote period, which may perhaps be presumed from what has been found by opening tumuli, as before related, we have no knowledge of the nature or the quantity of the products.

There will occur in a future stage of this inquiry an opportunity of entering more particularly into the state of the mines of Gaul, Hungary, and the northern kingdoms. As they were little productive before the time of Augustus, the accounts of them will be more appropriate at a later period.

The country most productive of the precious metals, but especially of silver, in very remote ages, was the Spanish peninsula. It had been visited and colonized both by the Phœnicians and by the refugees of that people, who had founded establishments at Utica and at Carthage on the shores of Africa, and both had early drawn supplies of silver from it. The oldest notices of it are to be found in the sacred writings. Solomon sent a commercial expedition there. Isaiah, who is supposed to have written about 600 years before Christ, asks the question—"Who are they that fly as a cloud, and as the doves to their windows?" and replies, "The ships of Tarshish, to bring thy sons from afar, Spain.

their gold and their silver with them[1]." Ezekiel also, when speaking of Tyre, says, "Tarshish was thy merchant, by reason of the multitude of all kinds of riches. With silver, iron, tin, and lead they traded in thy fairs[2]." And afterwards we find the following assertion on this subject: "The ships of Tarshish did sing of thee in thy market; and thou wast replenished and made very glorious in the midst of the seas[3]." We have thus, from the most ancient of all written records, two facts on which we can rely, viz. that the ships which arrived in Tyre from Tarshish were very numerous, and that their cargoes, to a considerable extent, consisted of gold and silver.

It has been suggested that the Tarshish of Solomon must have been some port on the eastern shores of Africa, or in the East Indies. Without entering into the discussion, we may observe that the place at which Jonah is related to have embarked for Tarshish, Joppa, now Jaffa, being on the Mediterranean sea, it seems clear that the place of his destination must have been on the shores of the same sea.

It is necessary, however, to have recourse to the ancient profane writers to arrive at certainty; and the examination of them has led, with most

[1] Isaiah, cap. lx. v. 8 and 9.
[2] Ezekiel, cap. xxvii. v. 12.
[3] Idem, cap. xxvii. v. 25.

persons, to the conclusion, that the Tarshish of the Jews and the Ταρτησσός of the Greeks was a country in the southernmost part of Europe[1]. We read in the ancient writers of the river Tartessus—of the island Tartessus—of a city Tartessus—and of a province Tartessus. From these various objects to which the name is applied, as well as from the uncertainty of the names given by ancient geography, we may, perhaps, safely infer the little dependence which can be placed on the name of the precise place. It may not be unnatural to suppose that the first visiters gave a general name to a large country, in the same manner as the discoverers of America gave to that continent, and the islands collectively, the name of the Western Indies. Tarshish, which was in the westernmost part of Europe, according to the Greeks, may then comprehend the whole of the division of Spain and Portugal, from the mouth of the river Ebro to Cape St. Vincent, or it may have included the whole of both the modern kingdoms of the peninsula, as far as they were known to the Phœnicians and Carthaginians.

It is more difficult to fix the precise date of the first intercourse between Phœnicia and Spain, though the commerce must have been

[1] See particularly Strabo, book xii. cap. 3.

considerable as early as the age of Solomon. It is said by Diodorus[1] that the Tyrians first visited Spain as traders; and, when they had become acquainted with the natives, introduced many colonists, in order to lay a more sure foundation for their commerce. The building of Gades (now Cadiz) must have followed soon after the discovery of the country. Velleius Paterculus[2] states the foundation of that city to have been about the same as that of Utica in Africa, in the time of Codrus, 1100 years before Christ, as the date of the building of the latter city is fixed by Aristotle[3], who adds, as is to be found ἐν ταῖς Φοινικικαῖς ἱστορίαις.

At first the Phœnicians established themselves on the defensible island of Gades, but speedily erected other cities, especially Carteja, between Algesiras and Gibraltar, Malacca, now Malaga, and Hispalis, now Seville. Though, for greater security, they first settled themselves in strong positions, the whole country was in a few generations covered with smaller Phœnician towns, to the number of more than two hundred. By the constant immigration of five centuries and the natural increase, their power was sufficient to gain them unlimited authority over the abori-

[1] Diodorus, book v. cap. 2. [2] Velleius, book i. cap. 2.
[3] Arist. de Mirabil. cap. 146.

gines, who were at length either mixed up with them or brought into subjection.

According to the description of Diodorus[1], the inhabitants of Spain were in almost the lowest stage of society when the first Phœnicians visited it. The relations of that author may not be literally true, but rested on some facts possibly mistated or exaggerated in the hands through which they had passed before they were committed to written records.

We are informed by the author last mentioned, that the Pyrenean mountains were covered with thick woods, that those were set on fire either by the shepherds or by lightning, and continued burning a long time, and that the effect of such fire caused the melting of the minerals; in consequence of which the pure silver ran down into the valleys like a stream of water.

As the inhabitants were unacquainted with its value, they readily exchanged it with some Phœnician traders, who accidentally visited their shores, for such trifling ornamental articles as they had brought. The traders are said to have loaded their vessels with the precious metal till they could carry no more, and then to have cut the leaden anchors from the bows and replaced them with others of silver.

Such a store of silver as was on or near the

[1] Diodorus, book v. cap. 2.

surface, however it may have been formed, could not be so large but it must be soon exhausted after it became known to people so active and enterprising as the Tyrians, the Sidonians, and the Carthaginians were in that day. The establishment of the colonies already mentioned would naturally follow, and at first would principally be made use of to form garrisons for troops to protect the stores which contained the goods brought to exchange for the precious metal, as well as the metal itself when once obtained. The new settlers, by means of their troops and their superior weapons, speedily compelled the aborigines to explore the bowels of the earth for silver, and thus inflicted on those uncivilized people a series of calamities which exhausted their strength and thinned their numbers.

"These people," says Diodorus, "though by their labour they enriched their masters to an almost incredible extent, did it by toiling night and day in their golden prisons. They were compelled by the lash to work so incessantly that they died of the hardships in the caverns themselves had dug. Such as by great vigour of body continued in life were in a state of misery, which made death a preferable fate."

This oppression and exhaustion of the native labourers led to the trade in human beings, which was carried on by the Carthaginians with the interior of Africa, and supplied to Andalusia

the place of those native workmen who had been destroyed by the excessive toil imposed on them by their Asiatic intruders. This horrid traffic was extended and continued, and it augmented the produce of the mines of Spain in such a degree as to have an influence on the whole commerce of the world at that period. That influence was continued till the government of the Romans, who succeeded the Carthaginians in the mastery of Spain, had fallen into the hands of the Gothic monarchs.

The first mines excavated by the Phœnicians were probably confined to Andalusia. The chief of them were at the foot of the Sierra Morena, near the frontier of Jaen, and not far from the river Guadalquiver, by which the produce could be conveyed by water to Hispalis, now Seville, one of the chief garrisons and marts; and where even at the present day stands the magazine called the Torre del Oro, said to have been built before the christian era.

Silver was the chief mineral wealth; but besides that metal, gold, iron, and lead were procured in the south, and some tin in the north of Spain. The gold was probably inconsiderable. It is not mentioned by Ezekiel in his curious catalogue of the wares which formed the trade of Tyre in the chapter before referred to, and it is but slightly noticed by the profane writers.

The commerce of Spain was not however con-

fined to the precious metals, for in process of time, as the colonists became amalgamated with the aborigines, and a new race of people had been thereby formed, the soil was brought into a state of productive cultivation. Other substances were raised, and contributed to increase the value of the intercourse, at first to the Phœnicians, and at length to the Romans. These productions are recounted by Strabo, and consisted of corn, wine, oil, wax, fine wool, and salted fish. At that period the wool of Spain had attained such a high value that a ram of the best flock, when wanted to improve the Roman breed, according to that author, was valued at a talent [1].

The early commerce of the Phœnicians, as well as of the Carthaginians, with Spain, had been conducted by mere barter. They exchanged the commodities they carried to Spain for those of that country, which were in most request in the several other parts of the world with which they traded. Tyre was however the centre to which all kinds of goods were conveyed, and from which they were again distributed in the districts where each was demanded. The vast gain thus acquired must have left a constantly increasing surplus of wealth, and especially of the most compendious kind of wealth, the precious metals, in that metropolis of the ancient commercial world.

[1] Strabo, book iii. cap. 1.

If we may give credit to a fragment still remaining of that ancient historian Agatharchidas, there was a time when the value of silver in Arabia was tenfold that of gold, owing to the abundance of the latter and the scarcity of the former metal. How far this may be accurate it is impossible to say, though, from the direct intercourse of Arabia with India, and from the Arabians knowing nothing of Spain but through the Tyrians, it is highly probable that the relative value of the two metals might have been widely different in that age from what exists at present. The Tyrians, however, certainly conveyed much of the silver they procured in Spain to Arabia, and there exchanged it for gold to great advantage; and there seems traces of an intercourse between Tyre and the countries beyond the Straits of Babelmandel, if not with India itself. This view of the relative value of gold to silver in different parts of the world in very ancient times, may serve to account in some degree for the curious spectacle which the extensive trade and the vast wealth of that naturally poor country, Phœnicia, exhibited in the early period of the history of mankind.

We return from these matters of trade in remote ages to the mines of Spain. They are by all ancient authors represented as highly productive, but none of the accounts they have transmitted to us are sufficiently statistical to

enable us to form accurate ideas of the quantity of the precious metals they yielded, or of comparing their produce with that of the other mines which fell into the hands of the all-conquering Romans.

The accounts that seem to approach the nearest to precision are those given by Pliny; but it is to be recollected that he wrote three hundred years after the time when the mines had been wrested from the Carthaginians by the Romans, and when their produce had greatly declined from what he represents it to have formerly been.

We find in that author the following general view: "Some have related that Asturias, Gallicia, and Lusitania furnish two thousand pounds of gold annually; but Asturias supplies the most; nor in any other part of the world, during so many ages, has so great a quantity been obtained. In every species of gold there is a proportion of silver; in some, one tenth part, in others a ninth, and in others an eighth. In one kind of gold alone, called Albicavense[1], there is only one thirty-sixth part of silver, on which account it is more valued than any other[2]."

In another chapter he says, "Silver is found

[1] Albicavensis is not to be found in Spain. The Albici are noticed by Julius Cæsar as a people in Gallia Aquitania (Bell. Civ. i. cap. 34.), but not as producing gold or silver.

[2] Pliny, book xxxiii. cap. 4.

in all the Roman provinces, but the best in Spain, and that in a barren soil, and even in the mountains. Wherever one vein is discovered, another is found not far from it. It is very singular that the mines begun by Hannibal still exist, and retain the original names given by the persons who first explored them. One is still called Bebulo, from the discoverer, which formerly supplied Hannibal with three hundred pounds weight of silver daily [1]." This the same author informs us was effected by means of passages under the mountain a mile and a half in length, in which the labourers, standing in water, worked night and day by lamp-light to turn off the water, which at length formed a large river.

Polybius, as quoted by Strabo, informs us that " The silver mines near to New Carthage in Spain were very productive. They were distant from the city about twenty furlongs, and embraced a circle of forty furlongs, wherein forty thousand workmen were constantly employed, who at that time procured for the Roman people twenty-four thousand drachmas daily [2]."

The mine of Bebulo, which is said to have yielded to Hannibal three hundred pounds weight of silver daily, does not appear to have produced that quantity when Pliny composed

[1] Pliny, book xxxiii. cap. 6.

[2] Polybii Fragmenta, tom. iii. p. 220. edit. Ernesti.

his great work; nor, as far as we can see in that author, does it appear to have been then productive. The situation of that mine is at present well known to have been at Guadalcanal, in the modern province of Cordova, at the foot of the Sierra Morena; and, judging from what has been surveyed of it in more recent times, the water, which was imperfectly drained by the costly subterranean tunnel noticed by Pliny, has long since overflowed the whole of the interior of the mine; but whether it was exhausted of its treasure and abandoned on that account, or whether it was destroyed by the influx of the water, cannot now be ascertained.

Near Carthagena, the New Carthage of the Romans, there are no traces of any mines, nor in that part of Murcia any indications of ore containing the precious metals. There may possibly have been some other place bearing the same name. If, however, we give full credit to the extract from Polybius, we shall be led to the conclusion, that the mines were more productive than profitable. If the drachma be taken at seven-pence halfpenny of our money, the value of the produce of the mines would be about seven hundred and eighty pounds daily. This distributed among forty thousand labourers would be four-pence halfpenny a day for each. The pay of a foot soldier at that time was two-pence halfpenny per day, besides an allowance

of bread, corn, and other food, which must have been of nearly equal value; so that, supposing the pay of a miner to be no higher than that of a foot soldier, that there was no variation in the produce of the mines, and that no capital had been expended in the various works, which in all cases precede the products and usually amount to a large sum, it would appear that the silver procured must have cost more than its current worth.

The produce of the mines then exceeded the natural quantity, that is, the quantity which would have been extracted if mere pecuniary profit had been the sole object of the undertakings; it exceeded that quantity, owing to the exertions which the Carthaginians made with a view to the invasion contemplated by Hannibal of the Roman territory, and owing to the presence and personal inspection of that distinguished and energetic commander.

As the inferior kind of work in the mines was performed in part by convicts and by slaves, an officer, like the Carthaginian general, with an object before him of such magnitude as scaling the Alps, and exterminating the vast power and the appalling name of the Roman people, would think little of the cost of that metal which he must have contemplated as one of the indispensable means of his ultimate success.

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Islands in the Mediterranean.

It does not appear that either the Carthaginians, when they were in possession of Sicily, Corsica, Majorca, Minorca, or Malta, or their successors in the dominion over them, the Romans, extracted either gold or silver from the soil of those islands; nor have any indications of those minerals been found in them.

Some silver and some gold pyrites have been occasionally discovered in Sicily; so that it is barely possible that mines may have been at some remote period worked there, no indications of which are now to be met with.

We read, indeed, of great sums of money being coined and circulated in Sicily; but those may be attributed, in some measure, to the vast production of corn, of wine, and other commodities which the island exported, and for which money must have been the principal return; as Sicily had scarcely any wants beyond those which her own territory supplied.

The continued wars of which Sicily was the theatre must have greatly contributed to increase the quantity of gold and silver within the island, and have furnished the means for coining the money which circulated there. The Athenians, when they equipped an army to assist the Leontines against the Lacedemonians in Sicily, are said to have taken with them in ready money ten thousand talents; and, afterwards, their

commander, Nicias, received a remittance of three hundred talents more. The Carthaginians also, who carried such large armies into Sicily, must have furnished some store of gold and silver.

Some of the precious metals were placed under the guardianship of the popular superstitions, but they were found feeble securities against the rapacity of a tyrant. It is related of Dionysius the Elder, that he rifled the temple of Jupiter, and stripped the image of that deity of the golden robe which Hiero had presented to it, saying, that "a robe of gold was too heavy in the summer, and too cold in the winter, and therefore he would supply its place with a cloak of wool." He ordered the golden beard of Æsculapius to be taken from him, saying, "It was a shame for the son to have a beard when the father had none." He also robbed the statues of the other gods of their ornaments, and sold the spoils by public auction; and, the next day, pretending to repent of his impiety, commanded all who had any thing in their possession belonging to the immortal gods to restore it within a stipulated time, but did not himself repay to the purchasers of the effects the money he had received for the sale of them.

If the soil of Sicily contributed nothing to the general stock of the precious metals in ancient times, it was otherwise with the large island of Sardinia. When the Carthaginians

obtained possession of it, about five hundred and twenty years before Christ, it yielded some gold and much silver, though the operations were impeded by the rudeness and fierceness of the inhabitants, who retired to the fastnesses of the mountainous districts to secure their independence, and from which they could conveniently issue forth to harass the intruders.

Captain W. H. Smyth of the royal navy, who has visited Sardinia within the few last years, and has given the best account of that island, says, "The mineral riches of Sardinia were well known to the ancients; and vast excavations, with the remains of nine founderies still to be traced, afford ample testimony of the extent of their operations. Tradition asserts, that gold was formerly extracted. There is no doubt but silver was found in considerable quantities, as it is even now produced in assaying lead. A vein of lead near Rio de Cano yielded six ounces of pure silver in a quintal of ore[1]."

Great Britain.

Although but small quantities of the precious metals were obtained in this island in the remote ages of antiquity, yet the whole subject of the extracting and refining the several minerals is too interesting to ourselves to allow of the omission of any of the few notices respecting those operations that have come down to the present day.

[1] Smyth's Sardinia, 1828.

The inhabitants of this island had carried on mining operations, solely by their own discoveries and inventions, several centuries before the Romans had acquired dominion over the country. The existence of gold may be presumed, from money of it being found amongst the inhabitants when the Romans first gained a knowledge of them. Strabo informs us that silver mines were worked[1]. There was no want of copper, though probably the Britons had made no progress in the art either of refining or of converting it to useful purposes, for their copper tools and utensils were supplied to them from foreign countries[2]. Although in the time of Julius Cæsar iron was so scarce that pieces of it circulated in the place of gold, yet in the time of Strabo, one century later, it had so increased as to become an article of export[3].

The most celebrated metal of Britain was tin. This the Phœnicians had brought to Cadiz, and enjoyed a monopoly of it; but the secret of the district from whence it was extracted was at length discovered by some Romans whose ships followed those of the Phœnicians to the before unknown country of Cornwall in Britain[4]. Publius, the Roman proconsul in Spain, after several unsuccessful attempts, opened to his country-

[1] Strabo, iv. p. 305.
[2] Cæsar and Strabo.
[3] Cæsar. Strabo, iv. p. 305.
[4] Strabo, iii. p. 265.

men the access to the long-celebrated but previously hidden treasures of the Cassiterides or Tin Island[1]. Until the Romans had completed the conquest of the island, the Britons worked the mines of tin and lead in a mode they had themselves discovered[2]. We are not so well acquainted with the manner in which they were explored, as with the subsequent operations of smelting and refining the metal. The business of smelting was conducted with great simplicity.

The ore was broken and placed in a pit dug in the ground, with wood between it and on the sides of the heap; the wood was set on fire, and by this the ore containing tin and lead was brought to a flux. The separation of the metal from the scoriæ was effected by passing the fluid metal out of the pit in which it had been melted, through a narrow canal or gutter, into another by the side of it. Such places have been examined in several parts of the island by Pennant, who found in them both chared wood and scoriæ. Though this process was simple, it seems to have been effectual; for so little metal was left in the scoriæ, that it would not pay in modern times the expense of extracting it[3]. Polybius promises in a passage of his history[4] to give a circumstantial description of the process of prepar-

[1] Strabo, iii. p. 265.
[2] Strabo, i. p. c.
[3] Pennant, vol. i. p. 58.
[4] Polybius, iii. 57.

ing the tin in Britain; but that must have been included, if he performed his promise, among the other valuable works of that author which have been lost: but perhaps the process here pointed out may be the same, or nearly the same, as Polybius intended to communicate.

We are informed by Diodorus [1], "that the people of Balerium (Cornwall), from their intercourse with merchants, were more civilized and courteous to strangers than the other inhabitants of Britain. These people dig the tin out of the ground with much care and labour; but the metal is mixed with earth, out of which they draw it by melting. They beat it into four-square pieces like a die, and carry it to a British island near at hand called Ictis. Then the merchants transport the tin they buy of the inhabitants to France, and during a journey of thirty days carry it in packs on the backs of horses through that country to the mouth of the river Rhone."

[1] Diod. book v. cap. 2.

CHAPTER III.

On the transfer of the precious metals from some parts of the world to others, as indicated by the sacred and profane writers.

HAVING taken a view of the narrations contained in ancient writers of the stock of gold and silver accumulated in particular spots, and of the mining sources from which those stocks were extracted, it may be desirable to trace the causes which led to their transfer from one country to another, and the channels by which they may have been conveyed, and thus to establish the veracity of the records, whether sacred or profane, from which we derive all our knowledge of those remote transactions.

The oldest account we have of any large accumulation of gold and silver, as we have already seen, is that in the possession of one of the earliest kings of the Hebrew nation. It may appear extraordinary that Solomon should have been able to collect so large a portion of those metals at a period when the other nations of Asia and Europe were so scantily supplied with them. The Greeks of that day were nearly destitute of

them; for at the siege of Troy, about one hundred years later than Solomon, though some of the chiefs had ornaments about their arms and personal decorations of those metals, the use of them was beyond the reach of their followers. Neither Homer nor Hesiod speak of gold or silver as money, but express the value of commodities by a certain number of sheep or oxen. Both these poets indicate the wealth of an individual by the number of his flocks and herds, and that of a country by the abundance of pasture and the quantity of brass and of iron it contained.

In the camp before Troy trade was carried on, not by money, but by exchanges in kind; and the wines of Lemnos were purchased with brass, iron, skins, oxen, slaves, and other commodities [1].

It seems to have been a much later period before even a moderate stock of gold and silver had been accumulated in Greece. Till the time of Gyges, king of Lydia, 720 years before Christ,

[1] And now the fleet, arrived from Lemnos' strands,
With Bacchus' blessings cheer'd the generous bands.
Of fragrant wines the rich Eunæus sent
A thousand measures to the royal tent:
The rest they purchased at the proper cost,
And with the plenteous freight supplied the host:
Each, in exchange, proportion'd treasures gave—
Some brass or iron, some an ox or slave.
Pope's Iliad, book vii. v. 560—568.

or about 300 after Solomon, no other metal was to be seen in the temple of Delphi but brass, and that only in the tripods. One hundred and fifty years later still, the Lacedemonians were obliged to have recourse to Crœsus to procure the gold of which they formed the statue of Apollo on Mount Thornax[1]. Subsequently by fifty years, Hiero, king of Syracuse, sought everywhere for a long time to obtain gold wherewith to form a statue of Victory, and a tripod for the temple of Delphi, and at length found some at Corinth, in the house of one Archiletes, who had collected it by purchases in small quantities. That person supplied the king with the weight he required, and, besides, gave him a handful, which Hiero repaid by sending in return a vessel laden with corn. Athenæus[2] quotes a passage from Anaximenes of Lampsacus, the tutor of Alexander the Great, who wrote about 350 years before Christ, which relates that the golden necklace of Eriphyle, which had been given to her by Polyneces, and had formerly belonged to Venus, was chiefly celebrated because gold was so scarce in Greece. The same author says, that Philip, king of Macedon, in the early part of his reign, before he had procured gold from the mines of Thrace, whenever he retired to rest, placed under his pillow the

[1] Herodot. book i. sec. 19. [2] Athenæus, book vi. cap. 5.

small and only cup of gold he possessed, which he prized highly on account of the great rarity of that metal.

This picture of the scarcity of the precious metals in Greece, from the earliest history of that people down to the beginning of the reign of Philip, forms a most striking contrast with the representations given by historians of their abundance in Egypt and in Judea in the contemporary ages, as well as of that which is related of the riches of Alexander when he had achieved his Asiatic conquests. Though the contrast may be great, it involves no contradiction; and the condition of the several people may be sufficient to account for any apparent discrepancy which the different relations may exhibit.

Greece in its early stages of society appears to have been inhabited by a race of wild and ignorant savages, living upon such herbs and roots as were spontaneously produced, and taking shelter from inclemency of weather in dens, clefts, or hollow trees. The first improvement in their condition is attributed to Pelasgus, who is calculated to have been a contemporary of Abraham; and his chief merit appears to have been his inducing the people to gather acorns for food, to build huts, and to clothe themselves with the skins of animals—a merit for which he was long venerated, if not worshipped. They

were unacquainted with agriculture, and ignorant of laws to secure the possession of property. Their associations were too slight to afford protection to the weak against the strong; and those only were safe from invasion who inhabited the most rocky and barren spots of ground, such as Attica, where the inhabitants, from having remained undisturbed for a long time, took the name Autothones, or indigenous people. The ancient governments of Greece were most rude and barbarous; every city and almost every small town and village being a petty tyranny, governed by a chief, to whom the title of king was given. If some improvements had been made in the several countries or kingdoms into which Greece became progressively divided, between the time of Pelasgus or of Abraham, and that of the epoch of the Olympiads, or of Uzziah, king of Judah, the progress was not such as to create any doubts of the great superiority of the Hebrew people over the Greeks, in civilization, in government, in the arts of life, as well as in religious feelings and opinions. That some of the Greek nations, and especially the Athenians, at a period subsequent to the reign of Solomon, advanced at a rapid pace, whilst the Hebrews remained stationary or retrograded, can be no objection to the general veracity of the view, now under consideration, of the quantity of the precious metals accumulated at the given period

of about 1000 years before Christ. The Greeks are scarcely noticed in the historical books of the Old Testament. Some have thought they discovered allusions to that people in passages in the prophetic writings; but the different names given to the places make it very doubtful. The knowledge which the Hebrews had acquired of the other parts of the world seems to have been confined to Egypt, Arabia, and that part of central Asia which they comprehended under the general names of Chaldea or Assyria. Those were the countries most advanced in civilization, and they consequently attracted most attention; whilst Europe in general, not excepting their near neighbours in Greece, must have been overlooked as barbarians, if their name had ever reached the Israelites.

Having thus endeavoured to account for the scarcity of the precious metals in Greece at an early age, we may proceed to consider how it could have happened, that at a correspondent period so large a quantity of them should have been collected, as the sacred writers represent to have been possessed by the Israelites when they became settled in Palestine. The institution of archons in Athens, under which the first steps towards improvement were made, nearly corresponds with the period in which Saul, the first king of the Israelites, was installed in that

dignity; but that institution had not had time to develop itself at the period of the erection of the costly edifices of Solomon in Jerusalem. The laws of Solon, to which Athens was mainly indebted for its subsequent prosperity and its ultimate fame, were not introduced till four hundred years after the time we are now reviewing. Lycurgus, the lawgiver of Sparta, was born one hundred years after Solomon; and his system of laws was by no means favourable to, nor productive of, national improvement in the arts of peace, or to the increase of the wealth of the community which adopted it.

The other countries of Greece, Bœotia, Thebes, Ætolia, Locris, Doris, and Achaia present in their brief history but few notices, and none which can lead us to consider their progress in civilization to have been earlier than that of Athens and Sparta; and though Macedonia ultimately became master of the whole of Greece, it had only attained the rank of a kingdom, and a state of regular but rude society, two centuries after the reign of Solomon.

It is clear from history, that Abraham, the progenitor of the Hebrew nation, nine hundred years before the erection of the sacerdotal and royal edifices of Solomon in Jerusalem, had advanced towards the civilized state more than ten centuries before any part of Europe had emerged

from the lowest state of barbarism. We[1] read that he had not only flocks and herds, and male and female slaves, and camels and asses, but also silver and gold[2]. He purchased a field as a burying-place for four hundred shekels of silver[3]; and when he sent his servant to procure a wife for his son, he furnished him with vessels of silver and of gold to make presents to, or to purchase her from, the family of the female with whom he sought the union. The possession of these precious metals in their uncoined state—for it seems clear that they passed as money by weight, and not by tale—is a strong indication that the family of the Arabian patriarch was very far removed from that savage state in which the Greeks were existing several centuries later; and a farther proof is given by the knowledge of the fact of their practising agriculture, and thus having advanced from the shepherd stage of society to that of the husbandman. We[4] read that Isaac, who succeeded to the possessions of his father, "sowed the land, and received in the same year an hundred-fold." We also learn that he digged a well and built an altar, which leads to the conclusion, when connected with the cultivation of the soil, that the wandering life of this

[1] Genesis, cap. xxiv. v. 35.
[2] Idem, cap. xxiv. v. 53.
[3] Idem, cap. xxiii. v. 15.
[4] Idem, cap. xxvi. v. 12.

family had begun to change for a stationary residence, which is one step towards civil and social life.

In the next generation of this family, we find Jacob, the chief of it, was in possession of sufficient of the precious metals to send to Egypt, and to make purchases of corn for his famishing household; and when they emigrated to that country, it is highly probable that, besides their flocks and herds, they carried with them also an accumulated stock of that compendious wealth, their gold and silver.

Notwithstanding the darkness in which the history of Egypt is involved, we are enabled to obtain some glimpses of the state of society in that country at the time when the Hebrews were residents in it. It seems clear that the institution of castes, similar to that which exists in India, prevailed there; an institution which, though it tends to advance mankind to a certain stage of civilization, acts as an impediment to any considerable farther progress. The cultivators of the soil were the lowest of the castes. The sons of the husbandman were bound to follow the profession of the father; and this, combined with a fertility which depended on the casual elevation of the river, more than on the science or skill of the workmen, prevented the Egyptians from making much progress in agriculture. The Israelites, when settled among

them, enjoyed a greater degree of freedom; and being more skilful in the management of flocks and herds, increased both in numbers and in wealth with a rapidity much beyond the natives. Even when their prosperity had excited the animosity of the government, and had drawn upon them oppression and exactions, we learn that still "they multiplied and waxed very mighty."

We have already seen that the gold and silver mines of Egypt, Nubia, and the countries in their vicinity were in full activity at that time, and that those metals were in great abundance. It is then highly probable that an industrious and frugal people like the Hebrews, whose property kept pace with the increase of their numbers, would condense their savings, and keep in the more compendious substances some portion of their wealth. In the three centuries which the nation passed in Egypt, an annual small accumulation would amount to a large sum, to say nothing of the jewels of silver and of gold which before their departure they borrowed of the Egyptians. Accordingly we find that soon after the commencement of their wanderings the gold ear-rings of the females were sufficient to form the golden calf, and that contributions levied on all the males above twenty years of age, for the purpose of decorating the temporary tabernacle in the wilderness, amounted to twenty-nine talents and seven hundred and thirty shekels of

gold, and one hundred talents and one thousand seven hundred and seventy-five shekels of silver, or, in our money, to nearly two hundred thousand pounds.

In their way to Canaan, the Israelites plundered the people who opposed them; and the tribes who were exterminated in that country must have possessed some gold and silver; and though in most instances the inhabitants, and in some their cattle, were destroyed, yet the precious metals found among them would be carefully preserved. From the nature of the society which existed among those people whom the Jews overcame, their gold and silver would be for the most part in the hands of their chiefs, and be easily discovered and appropriated by the invaders.

We find that at Jericho[1] the gold and silver, as well as the vessels of brass and iron, were put into the public treasury; and though the wedge of gold, with the addition of the silver which Achan[2] had concealed, was but of small value, yet the circumstance of one of the private men having appropriated to his individual use these metals, to the amount of five hundred pounds of our money, creates a fair presumption that they were to be found in some quantities among this and the other tribes who were subdued. On

[1] Joshua, cap. vi. v. 19.
[2] Idem, cap. vii. v. 21.

entering into the possession of their conquered territory[1], we find one half tribe of the Hebrews was dismissed to their allotment "with much cattle and silver and gold, with brass and iron and much raiment;" and there can be no reason to suppose them more wealthy than the rest of their brethren.

In the period which succeeded to the government of Joshua, whilst the Israelites were ruled by judges, though they were often oppressed, and, according to the custom of the age, plundered by those who defeated them, yet they finally came out of each conquest successfully, and made those who held a temporary dominion over them more than repay the precious metals they had extorted. Thus Gideon[2], when he had defeated the Midianites, collected the golden ear-rings of the vanquished, which amounted to one thousand seven hundred shekels of gold, perhaps worth in our money five thousand pounds. In that period, too, we find some intimation of the precious metals in the possession of private individuals. Thus[3] Abimelech, with seventy shekels of silver, hired "vain and light persons" to commit a massacre on his brethren; and[4] Micah took from his mother eleven hun-

[1] Joshua, cap. xxii. v. 9.
[2] Judges, cap. viii. v. 26.
[3] Idem, cap. ix. v. 4.
[4] Idem, cap. xvii. v. 2.

dred shekels of silver, of which two hundred were converted into an image for idolatrous worship.

Under these two first monarchs the Israelites were engaged in constant hostilities; and though they occasionally met with reverses, they were generally, especially under David, successful; and it is obvious, from scattered notices, that by these operations the mass of the precious metals was increased[1]:—thus the spoil of Rahab was of the weight of a talent of gold; and near the close of the same reign, when Moab and Zobah and the Syrians of Damascus were defeated, the gold and silver and brass of these nations were brought together, and dedicated to the public service[2].

It seems then clear, that when the peaceful reign of Solomon commenced, the accumulated mass of gold and silver must have been the collection of more than eight hundred years, reckoning from Abraham, or of near five hundred years since the Israelites, on their removal from Egypt, had become an independent and, on the whole, a flourishing nation. The spoil of the several tribes which was taken during the theocracy was carefully preserved in the public treasury, and was protected by the solemn sanction of the religion of the Hebrews, which kept it in the tabernacle under the title of the Treasure

[1] 2 Samuel, cap. xii. v. 3.

[2] 1 Chronicles, cap. xviii. v. 8—11.

of Jehovah. None of it could be destined to profane purposes without incurring the guilt of treason against that great Being who was at once their spiritual and their temporal sovereign.

The metallic wealth which was collected at the time of Solomon's greatness had not arisen solely from the spoil of the nations which the Hebrews had subdued, or the profits arising from their agricultural pursuits. We find that they had already entered into commercial operations in the reign of David; and the extension of them seems to have opened channels by which gold and silver flowed in more copious streams, or at least at a more rapid pace, than they could have done by the rude operations of war, or the calm pursuits of agriculture.

At first the Hebrew nation was simply an agricultural people; all the institutions of their legislator, Moses, were calculated to preserve them in that state. They had none but domestic manufactures. Little or no division of labour, such as manufactures and commerce require, could take place where each family was fixed on a small portion of land, which was entailed on them, and could not be so alienated as not to return to the original holders at the end of a term of fifty years. It was a productive soil, poetically described as a land flowing with milk and honey. As the whole population was devoted to the labours of the field, the cultivation

must have been well executed, and in such circumstances much more of corn, wine, and oil must have been produced than the inhabitants could consume. Though in their progress from Egypt, and at their first settlement in Palestine, they had been a warlike and even an exterminating people, yet they had become at the accession of Solomon a settled nation, and formed those social ties with the surrounding kingdoms which led both to commercial intercourse and conjugal unions. The king himself married a daughter of an Egyptian monarch, and formed alliances of a commercial nature with Tyre and the other neighbouring states of Phœnicia.

The states of Phœnicia were then at their highest point of prosperity. They were the great manufacturers, navigators, and traders of the ancient world. The luxuries they fabricated of every kind were disseminated by their own vessels to every part of the known world, and brought back to their storehouses the metallic and other productions of the several nations with whom they traded. Their colonies in Spain, in Africa, and in the islands of the Mediterranean made returns of much silver, some gold, and considerable numbers of slaves. Their trade with Egypt, Arabia, and India brought to them much gold, together with precious stones, spices, incense, ivory, and other valuable products. In that period the situation of Tyre which is de-

scribed in the poetic language of Ezekiel[1] may be applied to the whole of Phœnicia—as "having by its great wisdom gotten gold and silver into its treasuries, and great riches," but as being protected by hired troops against foreign nations. Phœnicia was, however, naturally an unproductive country. A great part of its narrow territory was then covered with the forests of Lebanon, and yielded only those trees which furnished timber for constructing their dwellings and their ships. The more level parts on the sea-shore were too contracted for the dense population; and the chief pursuits of that population had no tendency towards agricultural improvement. They were thus the natural allies of the Hebrews, who, amidst their offensive wars on all the other surrounding nations, do not appear to have exercised any hostile acts towards the Phœnicians, though they were as grossly idolatrous as the other tribes who were exterminated.

We have no accounts of the intercourse between individuals of Phœnicia and Judea, though, from the character and circumstances of the two people, much must have subsisted: but we learn that the governments exchanged productions; that Solomon sent yearly to Tyre[2] "twenty thou-

[1] Ezekiel, cap. xxvii. This chapter contains an accurate and general view of the state of the trade of Tyre before its conquest.

[2] 1 Kings, cap. v. v. 11.

sand measures of wheat and twenty measures of pure oil for food for the household of the king;" and that the king, on one occasion, sent him "six score talents of gold[1]," or about six hundred thousand pounds.

This view of the intercourse between Phœnicia and Judea may enable us to account for a circumstance otherwise so strange, as that Solomon, the monarch of a country which afforded no articles for distant foreign trade, who had neither ships nor sailors in his dominions, and only the port of Ezion-geber, on the eastern branch of the northern part of the Red Sea, which had been conquered by his father, and the inhabitants destroyed, should have undertaken distant commercial expeditions. As the ships he sent on such expeditions were manned with Phœnician sailors, so it is probable they were loaded with the goods which he had received from those people in exchange for the cattle, the corn, the wine, the oil, and the other productions of the soil which he furnished to them.

We are informed of the amount of the precious metals which the fleets brought back to Solomon at the termination of a voyage of three years' duration, but whether it far exceeded the value of what they carried with them appears at least doubtful; and if we may judge from the

[1] 1 Kings, cap. x. v. 14.

circumstance of the trade ceasing with the reign of him who began it, and that long before his death, we shall perhaps conclude that it was not found beneficial, or in so small a degree as not to induce the continuance of it. It was never resumed, though one attempt at it was planned about a hundred years later, in the reign of Jehoshaphat[1], who built the ships for it at the same port of Ezion-geber; though, from causes which do not appear, the voyages were never undertaken, but the ships that had been built were broken up.

This extended discussion on the stores of metallic wealth in Judea can scarcely appear improper, though it has perhaps exceeded the limits which the importance of the Hebrew nation might entitle it to receive. It was, however, desirable to remove any doubts on the general credibility of the most ancient of records; and it seemed to form a point from whence the probability of the veracity of the profane authors upon the subject of ancient accumulations of gold and silver might be advantageously surveyed.

If we look at the state of society during the five centuries which passed between the reign of Solomon in Jerusalem and that of Darius Hystaspes in Babylon, we shall find that the

[1] 2 Chronicles, cap. xx. v. 36 and 37.

parts of the world most advanced in civilization were divided into small kingdoms ruled by petty tyrants, whose subjects had neither rights nor protection to oppose to the claims of their chiefs. Their labour was directed to such purposes as best suited his views. Hence there was no class of subjects possessing property which the chief, if he had occasion for it, could not claim and secure for his own use. This is shown by the relations already given of the kingdom of Lydia under Crœsus, and of Celænæ under Pytheus, both of whom drew to themselves the whole of that metallic wealth which the labour of their subjects could extract from the bowels of the earth. The precious metals would then for the most part be found in the hands of the kings, as we see was the case with the two who were the largest or at least the most prominent sovereigns of mining districts. These monarchs, though called kings, were, however, in point of fact, only feudatories of those greater monarchs who successively ruled in the eastern empires of Assyria and of Persia. The precious metals thus collected in the power of these minor kings was ready to be seized upon by, or to be presented to, the greater monarchs whenever occasion might call for the delivery of them. It was retained in smaller portions, ready to be given up to form large masses; and being in few hands could be easily collected and trans-

ferred to Babylon or Ecbatana, as the demands of the great sovereign might require. Had gold and silver been diffused in that as in subsequent ages, and especially as in modern times, among the whole of the subjects of the smaller kingdoms, in the form of common current money—had it formed the universal medium for the exchange of all commodities, and the universal standard by which their relative value towards each other was measured—there would have been a difficulty in collecting and amassing it which would have prevented the easy transfer that seems to have been made from one part of the world to another after each victory.

Before gold and silver were used as coin—when it was deemed exclusively either a royal or a sacerdotal privilege to possess it—when the chief depositaries of it were the palaces of Solomon, of Crœsus, of Pytheus, or Darius, or the temples of Jerusalem or of Delphi—those places would form reservoirs which would be easily moved with the course of conquests in the direction the conquerors might appoint.

During the short existence of the Babylonian empire, between the period when the Assyrian monarchy was absorbed in it, and that in which it was subdued by the Medes and Persians, the mass of metallic wealth had been prodigiously increased in that capital. That which existed in the more eastern parts of Asia had been long collected there. Commerce had brought additions

from India by Ormus on the Persian Gulf, and by the traffic of caravans, which arrived from various countries at that emporium. The treasures of the palace of Solomon, the magnificent temple he had erected, and the accumulated savings of five centuries, were transferred with its enslaved inhabitants to the capital of Nebuchadnezzar. About the same period the successes of Cambyses had enabled that monarch to collect and transmit to Babylon the vast treasures of Egypt that have been already noticed[1]; and these, whatever allowances may be made for the exaggerated statements of the ancients, must have amounted to a most enormous quantity.

Under the reign of Darius, the great imposts levied by that monarch must have augmented his treasures; and if the grand expedition of Xerxes scattered a portion, and even a very large portion, of them over the surface of the countries between Babylon and Europe, there was more than sufficient time to collect them again at the seat of the government in the hundred years which passed between the conclusion of that disastrous expedition and the period when Alexander the Great swallowed up the Persian state in his universal but ephemeral monarchy. If the actual amount of the revenue of the Persian empire, as stated by Herodotus, be but tolerably correct—if the account of the

[1] See page 13.

treasure collected and expended by Solomon be true—if the mines of Egypt produced but one quarter of the gold and silver which, according to Diodorus, was inscribed in the palace of Thebes —and if the treasure affirmed to be in the possession of Crœsus and Pytheus approached near to the amount at which Herodotus represents it, there seems good grounds to conclude that the whole spoil of Persia might amount to the sum at which Appian has stated it, or more than seven hundred thousand Ptolemaic talents, or upwards of forty millions sterling. The gold and silver which was in existence, at least the greater part of it, appear in that age and state of society to have followed in the train of the conquerors. Persia had conquered all that part of the world in which the greater portion of those metals were in use; for with the Romans little was to be found in that age; and it can scarcely be thought that forty or fifty millions, or even a larger amount, is an extravagant estimate of the coined and uncoined precious metals that could be collected in the Asiatic part of the world.

Without presuming such a quantity to have existed, perhaps without a much higher estimate, it will be impossible to account for the quantity at later periods, when the more clear and veracious statements of the Roman writers represent

the accumulations of the state and of individual citizens at a correspondent degree of magnitude.

Though Alexander might have carried with him to Europe a large portion of the precious metals seized in Persia, yet much of it would remain in that country after its conquest. The rewards given to his soldiers, and the payments to his allies, the funeral of Hephæstion, the gratuities to Harpalus and others of his satraps, would dissipate a third of his spoil; the expense of maintaining his court and his army till his return would absorb a large portion of the remainder; and hence we can see no difficulty in reconciling the accounts of the vast mass of treasure collected in Persia, with the comparative small amount of that wealth which Alexander left behind him at his death. As the treasure distributed among his followers would, according to the practice of soldiers in all ages, be expended where it was received, and would remain in that country, there seems no difficulty—in crediting the account in Arrian of the treasure extracted by Ptolemy Euergetes from the provinces left to the successors of Alexander about 240 years after Christ,—in believing in the truth of the terms which the Romans extorted from the same people,—or in yielding faith to the reports of the treasure which Paulus Æmilius ex-

hibited in his triumph at Rome[1], on his return from Macedonia after his victory over Perseus, another of the successors of Alexander.

Ptolemy is related to have returned to Egypt with immense booty, containing, among other articles, forty thousand talents of silver, many gold and silver vessels, and two thousand five hundred statues, many of them of the Egyptian gods.

When the Romans, after the conquest of Carthage, first entered Asia, and defeated Antiochus, one of the Seleucidæ, the successors of Alexander, about 190 years before our era, a peace was granted on condition of paying a tribute of fifteen thousand Euboic talents, of which five hundred were to be instantly delivered, two thousand five hundred when the Roman senate should ratify the treaty, and the remainder in twelve successive annual payments.

All the mines of gold and silver, with the produce they had yielded in the long series of preceding centuries, were gradually delivered over to the dominion of Rome by the succes-

[1] According to Plutarch, the money carried in this triumph amounted to two thousand two hundred and fifty talents of silver, and two hundred and thirteen talents of gold coin, besides many vessels of both metals. Livy, however, deems this estimate too high; but Velleius Paterculus makes it amount to double as much. The last opinion is probably right, since the money thus brought from Macedonia is said to have freed the Romans from taxation during fifteen years.

sive conquests of the countries in which they were found. Carthage, Spain, Germany, Greece, Asia, and Egypt, within little more than one hundred and forty years after the Romans had passed the Hellespont, became subject to their power. The mineral wealth of the world was thus in a great degree, by the time Augustus had attained the imperial dignity, concentrated in his dominions; and his capital, which had become the metropolis of the civilized world, was the focal point to which the gold and silver were attracted, and from whence they were distributed again to the several extremities of the empire, in that due proportion with which their powers of production enabled them to supply the necessities or the luxuries of imperial Rome.

CHAPTER IV.

On the financial management of their mines by the Romans.

It has been before mentioned that the Romans had but few mines in Italy, and, according to the observation of Pliny, they were very sparing of their contents. They certainly wrought no mines of gold or silver in any part of Italy before the commencement of the first Punic war, about 490 years from the foundation of their city, or 260 before our christian era. There is no information to be gained respecting the mode in which the few copper and iron mines they then possessed were administered. Our knowledge of the financial administration of the mines of the precious metals must be therefore drawn from later sources.

The Romans, till the time of their Carthaginian wars, were much too rude and warlike a people to pay great attention to the mechanical arts, or to their economical departments, till they were attracted to the consideration by having obtained by conquest possession of the sources of the wealth of the vanquished. The rapid suc-

cess of the Romans in their wars at home, a little before their first contest with Carthage, had put them in possession of the scanty mines of central and upper Italy; and the booty extorted from the subdued owners of them furnished the means of proceeding to other and more distant undertakings.

The success of the two Carthaginian wars delivered into their hands the most valuable of their enemies' mines in the western part of the African continent, in Sicily, Sardinia, and the south of Spain. A few years later, by their conquests in the east, the mines of Greece and Asia Minor came into their possession; and the victory over Perseus, or Perses, at the battle of Pydna (about 168 years before Christ), rendered them masters of the productive mines of Macedonia and Thrace. The other mines in the east, in Asia and Egypt, were transferred to the Romans by the successful campaigns of Pompey and Augustus; and the remainder of those in western Europe, in Gaul and northern Spain, by the victorious arms of Julius Cæsar and of Augustus. Thus the period of nearly three hundred years, between the first Punic war and the reign of the first emperor, had witnessed the aggregation of the whole mines in the power of one supreme and uncontrollable state.

By the laws of antiquity, as exercised among all the ancient nations, and at a subsequent

period adopted into the civil law, all mines and mineral deposits of gold or silver ore, or of precious stones, belonged, if on the public lands, to the sovereign, and formed a part of his patrimony; but if they were on private property, they belonged to the owner of the land, subject to the condition that, if worked by him, a tenth part of the produce was to be delivered to the prince; but if worked by any other person, with the consent of the owner, two tenths were to be paid by the operator, one to the sovereign, and one to the proprietor of the land[1].

As the Romans acquired the dominion in the countries by conquest, they naturally assumed to their government all the rights and possessions which had appertained to the former sovereigns, and, among them, the administration and advantages derived from the mining departments of those countries.

The Romans were unskilled in mining, as in all those arts which were not connected with the practice of war. The mines in the conquered territories differed according to their locality, their depth, the nature of the earth beneath which they were to be explored, and the practices by which they had been rendered

[1] See Gamboa's Commentaries on the Mining Ordinances of Spain, translated by Heathfield, vol. i. p. 15. This work contains much curious learning on a subject but little elsewhere discussed.

productive. The new masters in each country were therefore compelled to become the pupils of the people over whom they ruled, and to follow blindly the practices they found already established.

The mere manual labour in the mines of the conquered countries, as in upper Italy, had been exercised by slaves, and the Romans had been too long habituated to the practice of domestic and agricultural slavery to feel any repugnance to the continuance of it. The practice of slavery seems, by all the records of antiquity, to have at first originated, in some degree, from an improvement in the moral feelings of mankind, as, before it, captives taken in war had been commonly put to death; and cruel as slavery may be, it is certainly less so than indiscriminate slaughter.

Whatever may have been its origin, the extension of it arose from and strengthened the basest and most degrading feelings. It soon became connected with commerce, and was perhaps generally attendant on the earliest maritime expeditions among the Greeks, who first practised navigation. It appears from Homer in the interesting story of Emæus [1], that the Greeks, whilst they carried on trade in distant countries, entrapped the inhabitants and sold them for slaves.

[1] See Odyss. book xiii. v. 403, b. xiv. v. 15, and b. xv. v. 288.

We find in Strabo[1] some account of these kind of transactions, which convey an idea of their extent, and of the systematic manner in which they were conducted. "Trypon," he says, "who possessed a fortified place in Cilicia, first organized a company of pirates, and was quickly followed by others; but the chief inducement was the profit derived from the sale of persons reduced to slavery. Independently of the facility for making slaves, the pirates had in the island of Delos, which was a large and rich commercial place, a depôt capable of receiving and despatching a great number of the slaves in the same day."

"The Romans contributed largely to this kind of piracy. Having become rich after the destruction of Carthage and Corinth, they made use of a great number of slaves, which induced pirates to issue forth on all sides to furnish that luxury by depriving of their liberty all the persons they could seize upon."

"The kings of Egypt and of Cyprus also contributed to encourage this kind of piracy." In eastern Asia, in Egypt, and in Spain, it is probable, from the accounts we have, that the slaves employed in the mines were not collected by piracy, but by a kind of conscription from the neighbouring countries, under circum-

[1] Strabo, book xiv. cap. 5.

stances scarcely if at all less distressing to them than those inflicted by the slavery derived from piracy. The condition of such persons would resemble in some measure that of the agricultural villains under the feudal system of a succeeding period, or that of the serfs of the crown in the Russian empire. This too appears to have been the manner in which the mines in Macedonia were worked when that country was conquered by the Romans; for we learn from Livy [1], that after their general, Paulus Æmilius, had obtained possession of the province, he released the peasants from the obligations they were previously under of labouring in the mines at the command of the farmer of the finances.

The working of mines either by serfs or by slaves could neither be the most appropriate nor the most beneficial mode of operating. By the first method a great degree of oppression must be practised, and by the latter a great expense in purchasing slaves must be incurred, and by both only so much labour, and of the worst kind, would be performed as could be extorted by terror.

The Romans, where they gained a province, wished speedily to simplify, or, to use a modern phrase, to centralise their administration; and hence were induced to let the mines to farm,

[1] Livy, lib. xlv. cap. 18.

instead of working them on their own account, and for their own immediate benefit, as the former sovereign had done. This farming of the mines, when adopted, was in practice found injurious to the property so let. Leases for only short terms were granted to the farmers general of the imposts, who, with the shrewdness natural to such situations, looked only to the interests of the present moment. The labour, whether of serfs or of slaves, was conceded to them with the mines, and the power over them was exercised with no deficient degree of rigour. The farmers took out only the best ores, and neglected those of inferior quality; leaving them in the pits, where they soon became buried in the rubbish with which they were surrounded. Their object being to enrich themselves during the term for which they held the mines, they naturally neglected the interest of future workers, and suffered them to go to ruin.

Whilst exhausting the mines of the richest ores, they only cut the passages and propped the roofs in so slight a manner that if they lasted during the current leases they would all require to be reconstructed in a short period after; which, when the best ores had been extracted, would be at an expense that could not be replaced by any product of the inferior ores which had been left behind.

The various contrivances for keeping out the

water from the mines, and the machines and implements for extracting what could not be kept out, were all contrived to answer temporary purposes commensurate with the length of the period for which they were let to farm. To prevent this premature exhaustion, in some instances the censor limited the number of slaves to be employed, and shortened the term of the leases; but these regulations seem either to have been evaded or at least ineffectual.

During the continuance of the republic, as the mines did not improve in productiveness, they gradually deteriorated, but so slowly that their retrocession was not very striking till Rome fell under a despotism, and a new state of things with new institutions roused attention, and directed it to the declining state of that department.

It is not clear under which of the emperors the alterations were made; but soon after the abolition of the republic, the mines were all taken from the farmers, and the administration of them intrusted to officers of different ranks, who, upon a regular system, conducted the working of them for the sole benefit of the emperor. By this change the subterraneous works were more substantially and durably executed, and the exhaustion of the mines did not advance at so rapid a pace as before. But the expenditure was increased without a correspondent in-

crease of the proceeds. In this state they were feebly continued till the troubles which sprang up in all the frontiers and in the distant provinces brought the search for gold and silver to its termination. The decline of the mines which the Romans had acquired by their extensive conquests will fall more appropriately under consideration in a future part of this inquiry.

CHAPTER V.

On the consumption of the precious metals before the accession of Augustus to the imperial dignity in Rome.

When considering the consumption of gold and silver in the earlier ages of the world, it is necessary to bear in mind the great difference between the state which society then displayed, and that which it has since assumed. The governments at first were strictly patriarchal. The head of each family provided for the protection of the whole against hostile aggressions from the neighbouring tribes; and it thus became necessary that he should have the means of providing such weapons as the defence of the community required. The metals of which weapons were formed, at first brass and afterwards iron, were scarce, and, as compared with the common food and clothing then used, excessively costly; and though coined money of the precious metals was scarcely known, yet gold and silver had acquired the faculty of being more easily and conveniently exchanged for the other metals, than such commodities as corn and cattle. The gold and silver then would most

probably be preserved in the stores of the chief of the tribe or family as stock in reserve, to be retained as a sacred deposit, and to be applied only on an emergency of a pressing nature, such as the obtaining arms on occasion of an attack from an enemy, or to present as an offering to their deities to avert or to remove some general calamity. Whilst thus chiefly wanted for war or for superstition, it would be found necessary by all means to add to the stores. By one of the oldest laws of Athens, it was ordained that a thousand talents should be set apart yearly for defence against foreign invasion, and whoever proposed to apply it to any other purpose rendered himself liable to the punishment of death.

The hoarding of treasure for purposes of general defence, which began in the patriarchal state of mankind, was continued when larger communities were formed, and was perhaps universally practised by all who governed states or kingdoms, whether under the monarchical form, or under any of the several varieties of aristocracy which prevailed in the ancient world.

As it is probable that the far largest portion of the gold and silver of the ancient world was thus kept from circulating through many hands, there would be none of that consumption of them by friction by which coined money is now

constantly suffering a loss. Such loss, as will in a future stage of this inquiry be particularly examined, would be almost wholly avoided in the period of the world which we are now considering.

The coining of money upon a small scale had been commenced at an early period, and had been considerably extended in Rome after the great influx of gold and silver which followed the conquests of the three centuries before the reign of Augustus; but except after that accession it is not probable that coins were found in large quantities; for though they were current at fixed rates for small transactions, yet in large payments they always passed by weight, thus making the ascertainment of their country or tale a matter of little importance.

Pliny says, "In ancient time it was the practice to weigh out brass by the as or pound, which was thence called *as libralis*, and now *libella*, as the weight of two pounds is called *dipondius*. Hence a fine is called *æris gravis*, that is, brass in mass. Hence what is stated in an account as laid out is called *expensa*—because all payments were made by weight. The paymasters in the army were called *libripendes*, because they weighed out the pay to the soldiers; and the pay itself was called *stipendium* for the same reason. All buying and selling at this day are

usually performed by means of the balance, which alone serves to verify the bargain or contract[1]."

The earliest gold, the darics of Persia, have been already noticed (page 15.) The next to them were of some of the reigns of the tyrants in the island of Sicily; of Gelo, 491 years before Christ; of Hiero 478, and of Dionysius 404 years before that era. Some of them circulated in Rome before any had been coined in that city; specimens of those of Gelo and Hiero are still preserved in modern cabinets; but none of Dionysius that are free from suspicion[2].

There was no gold coin in Greece till Philip of Macedon had put the mines of Thrace in full operation, about 360 years before Christ. They are said by Diodorus to have yielded gold to the value of a thousand talents yearly, which was coined into pieces called Philippi, and became the common name for coins of the same size[3].

The most ancient silver coins of Greece are those with an indented mark on one side, and the figure of a tortoise on the other. The earliest of all have no letters on them; but those of a later period have AIΓI, which Pinkerton thinks means Ægina, but which other medalists

[1] Pliny, book xxxiii. cap. 3.

[2] Della Rarità delle Medaglie Antiche, da Vincenzio Natale Scotti, Firenze, 1809.

[3] Pinkerton, vol. i. p. 105.

have supposed means Ægium in Attica, and that the tortoise is the sign for the Peloponnesus [1].

Silver is said to have been first coined in Rome in the year of its building 485, or 266 years before our era [2], which seems to be confirmed by no coins having been found of an earlier date; though, according to Pomponius, a mint had existed there which twenty-three years before had been placed under the direction of the questor. That establishment was most probably only used at its earliest erection for coining brass money. The first gold coin of Rome followed that of silver, but not till after an interval of sixty-two years. Thus silver coin in Rome had existed about two hundred years, and gold coin about one hundred and fifty years, at the time of the accession of Augustus. We can hardly suppose that, at the commencement of the operation of coining, with the imperfect engines they had invented to perform it, any very large proportion of the whole mass of the precious metals had been converted into coin, or that the friction which occurs by wear in passing from one hand to another could have occasioned such a consumption as considerably to affect the whole amount in existence. There would too be the

[1] Pinkerton, vol. i. p. 67.
[2] Pliny, book xv.

less loss by friction on the gold coin at that than at subsequent periods, on account of the great purity of the metal.

It is well known now, and seems to have been ascertained at an early period, that the purer the gold is, the less consumption of it from friction arises in use. Without examining the chemical reasons for this, the fact is undoubted, and the ancients seem to have been acquainted with it. They had early acquired the art of refining it. We learn from Pliny[1], that in his time gold was refined by mercury, which mingled with it, but rejected all alloy; and the gold was afterwards freed from the mercury by squeezing both in skins; in which operation the mercury ran through, and left the gold in a pure state.

In the time of Philip of Macedon, the art of refining had arrived at great perfection, for his coins are found of the utmost purity; and they are rivalled by those of his son Alexander, and of the other princes and cities which immediately followed. The purest gold coin now circulating in Europe is that which issues from the English mint. Our standard gold consists of twenty-two carats of pure gold, and two carats of alloy. That of all the other kingdoms of Europe contains more alloy in different proportions; but except the Dutch ducats, which are few in

[1] Pliny, book xxxiii. 6.

number, all are worse than ours. The more ancient coins at some periods were far purer. Those of the successors of Alexander in Egypt contain twenty-three carats three grains of gold and only one grain of alloy. Bodin, as quoted by Pinkerton[1], informs us that the goldsmiths in Paris, in assaying some gold coins of Vespasian, found in them no more than a seven hundred and eighty-eighth part of alloy. Considering then the purity of the metal and the short duration and the limited circulation of gold, in the form of coin, we cannot estimate the consumption of it by abrasion to have borne any great proportion to the whole quantity in existence at the age of Augustus.

It does not appear that the same degree of purity was preserved in the silver coined by the ancients. The silver coins of the Greeks are inferior to our standard. Those of the Romans of the earliest period are also inferior to ours, though very slightly so; but from the reign of Severus very bad silver appears, and continues to the time of Dioclesian. From Claudius Gothicus to Dioclesian, that is, from 270 to 284 A. D., during which eight emperors reigned, the silver coins are very scarce; but they seem all to have degenerated gradually. Usurpers arose in Spain, from whence most of the silver

[1] Pinkerton, vol. i.

came, who greatly adulterated the metal. Pliny says[1], "miscuit denario triumvir Antonius ferrum;" and Pinkerton asserts, "I have tried a denarius of Anthony Leg. vi. which flies to a magnet like iron."

The Egyptian coins struck under the Roman emperors were at first of tolerable silver, but by degrees they degenerated into a metal called by the French metallic writers *potin*, being a mixture of copper and tin with a very little silver.

The greatest loss by wear in our money falls on the smaller pieces. Thus our half sovereigns and sixpenny pieces lose more than double their proportion of weight in the same space of time as our sovereigns and shillings[2]. This may be attributed to their more rapid circulation; to their passing more frequently through various hands.

In ancient times, when all necessaries could be purchased with copper or with iron money, on account of their very small metallic value, when the precious metals were hoarded by princes, and when there were scarcely any middle classes of society, the daily purchases of the more numerous body of the people would be made with money of the inferior metals, in which they received their wages. There could be little of what may properly be called circulation of any other than copper and iron, and

[1] Book xxxiii. cap. 9.

[2] See Appendix, No. 1.

the gold and silver would suffer, comparatively with the present time, little or no loss by friction in the use of it. Many of those applications of gold and silver, which in the present day contribute to its greatest waste, were utterly unknown to the ancients. Some of them have only been introduced into practice in very modern times, and what had in some measure been known to the ancients had only become so less than one hundred years before the reign of Augustus. The Romans were not quite ignorant of the art of gilding, though they had not brought it to the degree of perfection, nor carried it on to the extent, which it has attained in modern times. We are informed by Pliny that the first gilding was seen in Rome during the censorship of Lucius Mummius, soon after the destruction of Carthage.

The art of spreading out gold over a large surface, as practised in the time of Pliny, seems to have been plating rather than gilding. It is shown by that author[1], that by the hammer gold could be so extended, that an ounce of it would make seven hundred and fifty leaves, each of them four fingers in breadth and in length. When it is considered that our modern gold-beaters have so much farther availed themselves of the malleability of that metal as to make each

[1] Pliny, lib. xxxiii. cap. 3.

grain cover a surface of fifty-seven inches, we may safely assume that in the time of Pliny, though gilding had been discovered, it had made but little progress; and we are warranted in affirming that what was then called gilding was only a kind of imperfect plating, which, as Pliny says, was fixed on wood by a kind of glue; and it will appear probable that the shields of the Samnites were *(auro cælata)* covered with gold in that manner, as well as the statue of Apollo at Delphi.

The Romans about the time of Augustus began to gild the ceilings of their temples and their palaces, the capitol being the first of the buildings on which this kind of embellishment was bestowed; and the cost of which amounted to twelve thousand talents according to Plutarch[1], from whence it is denominated *aurea* by Virgil[2], and *fulgens* by Horace.

By gradual steps this kind of ornamental decoration extended itself from public edifices to private dwellings. The ceilings of the rooms between the beams were covered with gold, to which Horace refers, Lib. ii. Od. xviii.,

neque aureum
Mea renidet in domo lacunar;

and also Virgil in the Æneid, l. i. 726.

[1] Plutarch in Publicola.
[2] Æneid, l. viii. 348.

Such applications of gold as the ancients used in this way, as it exposed a surface less in proportion to its weight than our modern manner of extending it, would evidently cause a much less loss to arise from exposure and friction.

The other methods of gilding now practised on metals and on our china-ware were unknown to the ancients; and thus that mode of consuming gold, which is next to the loss by friction on coin the greatest in the present day, had no influence in more remote periods.

There are no indications of the ancients having attained the art of drawing wire of gold and silver so as to apply it, like the moderns, to the fabrication of gold and silver lace, though it has been thought they had some means of using it for the purposes of embroidering. This is inferred from a passage in Propertius [1], where he speaks of interweaving gold *(aurum intexere)*, and where he calls the garments made with it *Vestes Attalicæ*, from Attalicus, or Attalus, who has been supposed to have invented them.

As the luxuries of the east were introduced into Rome, the practice of using gold for some ornaments and for domestic purposes accompanied or followed them. Thus the lectica or chair which was brought from Asia, and was composed, according to Curtius [2], of solid

[1] Propertius, lib iii. s. 18. [2] Curtius, viii. 9.

gold, was imitated in Rome in wood; but, as Athenæus[1] says, had feet of gold. These lecticæ, or sedan chairs became at length so common, that Cæsar prohibited the use of them except to persons of a certain age or rank, and on certain days[2]. The bits of the horses' bridles and the collars on their necks were of gold; and the covering for their backs *(strata)* were adorned with gold and purple[3]. Their carriages were ornamented with decorations of precious stones as well as of gold and silver.

The art of enamelling, though it was known in the time of Pliny, seems to have made but little progress[4]. The operation is described by that writer in the following words. "The ancients contrived to paint silver, that in drinking they might be more devout from seeing their deities painted in their cups. This fashion is become so prevalent that even the statues which are carried in the triumphs are scarcely valued unless they are enamelled and painted black; and it is really surprising to think how much more valuable they are considered when the natural brilliancy of the metal is hidden and extinguished by such painting[5]." From the description given by our author of the mode of preparing the enamel, it seems clear that no

[1] Athenæus, v. 10. [2] Suetonius Cæs. 43. cl. 28.
[3] Virgil, Æneid vii. 279. [4] Pliny, xxxiii. c. 3.
[5] Idem, lib. xxxiii cap. 4.

other colour but black was adopted, and that it was used only for ornamenting drinking vessels, statues, vases, urns, and other large articles of furniture. At the present day, one of the greatest causes of the consumption of gold is the use of it in the smaller personal ornaments, and in a variety of trinkets, whose basis is gold, but whose chief value is the enamelling, which is wrought by skilful artists upon it. These, when the fashion changes, or the work of the artist becomes obliterated, the gold being in very minute portions, are lost or destroyed, or at least the same care is not taken to preserve such fragments as is applied to the larger pieces of ornamental furniture. In the present day it is supposed both in England and in France, that the quantity of the precious metals applied to these minor purposes by far exceeds that which is converted into larger objects, and that the loss in them is increased in some degree in proportion to the small size of the articles.

The consumption of silver in our age and country has been vastly increased by the application of the mechanical powers to the construction of flatting mills. By these machines a wedge of copper or tin and another of silver may be converted into a substance, homogeneous to every sense but the sight, exhibiting on one side the most brilliant silver, and on the other an appearance of a different metal. This plated

matter when rolled into sheets is converted into those beautiful pieces of domestic furniture which ornament the tables and sideboards of the middle classes of society, and enable them to rival in brilliancy those of the richest families, at a cost more proportionate to their means. There are no traces in any of the writings of antiquity of such an application of silver; and now, owing to the great surface which is exposed to friction, and our neat and decent habits, which require frequent cleaning and polishing, an enormous consumption of silver is produced in this way.

From the difference in these several modes of consumption, which have arisen in part from our increased knowledge in the working of metals, and from the diffusion of wealth into smaller, but not minutely small, portions, which have had a vast influence on the fashions of mankind, a degree of destruction of gold and silver which was scarcely felt in the ancient world has in modern times been steadily, but of late rapidly, advancing, and by its continuance must at length produce a sensible effect on the value of all commodities when measured by these metals.

CHAPTER VI.

On the effect of the increased quantity of the precious metals on prices from the earliest period of history till the establishment of the Roman Empire under Augustus.

If the two precious metals be in fact commodities like all others, except in possessing the faculty of being used as the measure of the value of all property, they must like the others be affected by their scarcity or abundance, though their denomination or their value with respect to each other may remain unchanged. If gold and silver are rare, they will exchange for a larger portion of food, clothing, or other necessaries; if the supply of them be large, they will exchange for smaller quantities of those articles. It is not then that other articles are dearer or cheaper, but that gold and silver are scarcer or more plentiful.

There are some difficulties in the way of marking with precision these variations in the value of the precious metals, by ascertaining the prices of other commodities. Such commodities are subject to variations, arising from their own scarcity or abundance, which may be caused by

propitious or unpropitious seasons, by the interruption of intercourse by war, by such desolating famines as the ancients were more subject to than the moderns, and by a variety of other innumerable but minor causes. There are also other difficulties in estimating the rise or fall of the precious metals in remote ages, arising from the uncertainty and variation in the weight and purity of the metallic money which circulated, and in fixing the exact measures of length or of capacity, and of the weights which were used in dispensing the several kinds of property.

In the earliest stages of society the chief trade must have been in the necessaries of life; and as soon as agriculture had been practised, corn would appear to be the best standard by which to measure the value of gold and silver; but this would be far from a sure criterion. In some ages and countries the soil, climate, or fashion of living made one kind of food cheap and another dear, whilst in other times and countries exactly the reverse is to be seen: thus in Athens, in the time of Solon, a sheep was worth but a bushel and a half of corn; and a few centuries ago a given weight of corn was equal in value to the same weight of meat in England; and at a later period, in the Highlands of Scotland, according to Hume, a pound of oatmeal was worth a pound of beef.

In the relative value of one kind of corn to

another there has been a great difference in different times and kingdoms. At one period wheat, at another barley, and at another oats have been the chief food; and in the early ages, in thinly peopled countries, the spontaneous fruits, such as chestnuts and acorns, must have formed a portion of the food.

These considerations are not of sufficient force to prevent an examination of the increase of the price of corn in Greece simultaneously with the increase in quantity of the precious metals. All that can be extracted from ancient authors is utterly incompetent to inspire confidence in the precision or accuracy of the comparison. It would be folly to pretend to exactness in a case which will merely admit of an approximation to it.

The historians of Greece were too much occupied with the great events of war, or with, to them, their more interesting political discussions and intrigues, to take much notice of the prices of the commodities.

"In the time of Solon (550 years before Christ) an ox in Athens cost five drachmas, or nearly three shillings; a sheep, one drachma, or seven-pence three farthings; and a medimnus of corn, or one bushel and three gallons, the same as a sheep: but prices rose gradually to five times, in many cases to ten or twenty times, their former amount, which after the example

of more recent times does not seem surprising. The quantity of money was not only increased, but through a rising population and extended intercourse its circulation was accelerated[1]."

From the time of Solon to that of Demosthenes, a period of about two hundred and twenty years, prices were continually rising; and though they fluctuated with the productiveness of seasons, they never were so low again as in the time of Solon[2]. It was during this period that the gold and silver of Persia had been brought into Greece by the hostile invasions of that power, and the subsidies of the Persians to their Grecian allies, and soon after the extension of the mines of Thrace by Philip had enabled that prince to corrupt the orators of Athens with it.

From a passage in one of the plays of Aristophanes it is inferred that the medimnus of maize was sold for three drachmas, or near two shillings, in the 97th Olympiad, 390 years before Christ; but in the time of Demosthenes, about seventy or eighty years later, and especially after the expedition of Alexander against Thebes, it was commonly sold as high as five drachmas, or about three shillings[3]. It is thus seen that the corn, which at one period was at one drachma, rose in two centuries to treble that price, and in

[1] Bœckh., vol. i. p. 84.
[2] Idem, vol. i. p. 127.
[3] Idem, vol. i. p. 128.

one century more to five times as much as at the first.

In very remote ages wars were undertaken chiefly for the sake of plunder. Individuals were engaged, too, perhaps, partly from a clanish spirit, and partly from the authority of elders or superiors. Under those circumstances military pay was unknown. The Athenians first paid their troops in the time of Pericles, about 450 years before our era[1]. From Athens the practice was extended to the other Grecian states, and within one hundred years was adopted by the whole of them.

At first, the pay of the foot-soldiers was two oboli a day[2], or a little more than twopence halfpenny, but within less than two centuries, when the mines of Laurion had been rendered more productive, we find the pay of the same description of troops had advanced to double that sum, or four oboli[3]. At the carlier period the soldiers were taken from a better class of inhabitants than in the later, when a description of persons had been admitted into the army who had before been excluded. At the first period the soldiers must have been considered a superior class to the labourers in the mines, who were paid but an obolus a day. It is not improbable that from the inferior relative rank of

[1] Ulpianus in Orat. de Syntaxi. [2] Demost. Philipp. 1.
[3] Thucydides, lib. iii.

the private soldiers in the later times, they might be deemed entitled to less comparative remuneration, and did not receive an augmentation in their pay correspondent to the decrease of value which the metallic money had suffered.

There is another circumstance which, though not conclusive, seems to show the diminished value of money in Greece. That sum which was deemed a sufficiency for the support of a family continued to be rated higher in the course of years, in a manner somewhat similar to the increase in the price of corn. At an early period, about 550 years before Christ, the possessor of a talent was considered in moderate circumstances, and was enabled to live on the income derived from it by interest at the rate of twelve per cent. per annum. Æschines, a celebrated orator, who lived about two hundred years later, had inherited a property of five talents, to which he added two, accumulated by his professional labours, and was deemed a man in easy circumstances. Demosthenes, who died about sixty years after, when the Thracian mines had been extended, died possessed of fourteen talents, besides his female slaves, and is remarked as moderately affluent. Conon, another Athenian, noted in the year 240 before Christ, left behind him forty talents, which is not spoken of as any thing remarkable[1].

[1] See Bœckh, vol. ii. p. 235.

Although it may be fairly assumed that the value of gold and silver had diminished between the time of Solon and the absorption of Greece into the Roman republic, yet it is only to be inferred from such vague testimony as can be collected from incidental assertions scattered through various authors as have been here quoted. Abbé Barthelemy, who paid so much attention to every thing relating to Greece, and especially to Athens, gave up in disgust his examination into the prices of commodities in the several stages of the history of those countries, concluding it thus: "J'ai trouvé tant de variations dans celles d'Athènes, et si peu de secours dans les auteurs anciens, que j'ai abandonné ce travail."

In Rome, the circumstances under which the inhabitants were supplied with bread corn makes the exact value of it, or of the money with which that value is to be measured, a case of great and constant doubt. The corn was sometimes extracted as tribute from conquered or subject countries. It was sometimes furnished to the public magazines by contract, and sold to the populace at lower prices than it had cost. It was at other times given to them gratuitously. These various circumstances do not, however, affect the view we must now take of it. They might have a temporary and even a great effect, but it would not be greatly operative on the differences between the cheapest and the dearest

periods, which are some centuries apart. Thus, if when wheat was at three shillings the quarter the adventitious circumstances lowered it, to the populace, to two shillings the quarter; and when it was at three pounds the quarter, the same or some other circumstances lowered it to two pounds; the difference between the two periods would be nearly the same.

Now we find, from Pliny, that the price of wheat was brought down by Marius Marcius, one of the ædiles of the people, about 350 years before Christ, to the price of an *as* the modius, or three farthings the peck, being equal to two shillings of our money the quarter; and at the time of Pliny it had reached three pounds the quarter. The few notices we have of prices in the intermediate times seem to show that the advance accompanied the increase in the precious metals; that like that increase it was at first slow, but peculiarly rapid after the concentration of the contents of the chief mines in the hands of the Roman government. Thus the tribune Clodius made a law that corn should be given to the people gratis, though it had before been sold at a rate equivalent to sixteen shillings and three-pence the quarter of our money. A little later, Cicero informs us, that two kinds of wheat were brought from Sicily; one, the *decumanum*, or tithe-corn, was sold at fifteen shillings and three-pence, and the other, called *frumentum im-*

peratum, at twenty shillings and four-pence the quarter. Cicero's charge against Verres was for exacting *duodenos sestertios in modios singulos*, which would make the modius or peck cost one shilling and ten-pence three farthings, and consequently the quarter three pounds one shilling.

"By the great access of riches and increase of money that happened afterwards, especially in the reign of Augustus, the price of corn as well as of every thing else was raised in Rome[1]." We learn from Suetonius, that "the royal treasures of Egypt being brought to Rome at the triumph after the war of Alexandria, there was such an abundance of money that, the rate of interest being lowered, a very great increase took place in the price of land. After this, when money flowed in from the confiscations, Augustus allowed the gratuitous use of it, for a fixed time, to those who could give security to double the amount[2]." Tacitus relates[3] that after the burning of Rome by Nero, it was a great consolation to the people to have corn reduced to three nummi the modius, or to about sixteen shillings the quarter, which had been the ancient price. It does not appear how long this comparatively cheap rate was continued; but it could not be of long duration, for when Pliny wrote, the prices had again risen, and

[1] Arbuthnot, p. 122. [2] Sueton. de August. c. 41.
[3] Tacitus Annal. xv.

were somewhat higher than in the time of Augustus, namely, three pounds three shillings and sixpence the quarter.

The price of bread in Rome when Pliny lived seems to have been nearly the same or a little lower than it usually is in our day in London. The Romans made bread of very different qualities and prices. Pliny enumerates four descriptions of them, viz. *Ostrearii*, or loaves baked with oysters; *Artolagani*, which correspond with our cakes, or rather rolls; *Speustici*, from the quick mode of the preparation; and *Artopticii*, or those baked in ovens, so called from the kind of furnace in which they were prepared. This last must have been of nearly the same quality as our middle sort of wheaten bread, and was sold, according to the calculation of Arbuthnot, at the rate of three shillings and two-pence the peck loaf.

The prices of cattle kept pace in their increase with those of corn. At an early period of the history of Rome, in the time of Epicharmis, about four hundred years before our era, the price of a calf was one shilling and seven-pence, of a sheep seven-pence three farthings, and of an ox as much as ten sheep. This is inferred from the fines inflicted for offences, which were originally paid in cattle; having been commuted for money at the value which cattle bore when the penalties were enacted. The prices at a later period

are drawn from those works of Varro which are still extant (for the greater part of his writings are lost), who lived about the time of the birth of our Saviour. According to that author, as deduced by Arbuthnot, the price of a sheep was twenty-five shillings, of a calf three pounds two shillings and sixpence, and of an ox twelve pounds ten shillings [1].

Although the pay of the troops may not be a very accurate criterion of the value of the precious metals, it is a subject which cannot be entirely overlooked.

The Roman soldiers, like the Greeks, at an early period received no pay. It was first given to the infantry four hundred and seven years before our era, and to the cavalry three years later, during the siege of Veii [2]. At first the stipend was three asses, or two-pence farthing, to the foot; and double that sum to the centurion; whilst treble was paid to the horsemen [3].

About the year 150 before Christ, though the pay had not been augmented, the soldiers were allowed, in addition to it, a certain portion of corn; most generally four pecks a month. About

[1] In the greater part of what relates to the prices of corn and of cattle, at the several periods, the authority of Arbuthnot has been chiefly relied on, and the 2d and 4th chapters of his second dissertation have been followed. See pages 120 and 126, edition 1727.

[2] Livy, b. iv. 59. and b. v. 7. [3] Polybius, vi. 37.

eighty years later Julius Cæsar doubled the pay, making it six[1] asses, or four-pence halfpenny; and Augustus[2] about sixty years after increased it to ten asses, or seven-pence halfpenny; besides this that emperor gave a large pension during the remainder of their lives to those who had served twenty years[3]. This formed a tempting inducement to enter into the army, and to continue in the service till the period was arrived when the soldier would be entitled to his pension.

It may perhaps be rash to assume that these advances on the pay of the soldiers were owing exclusively to the increased quantity of gold and silver which had poured into Rome. The favour of the troops was too important to the aspirants for predominance not to have contributed somewhat to the advance of pay. It is now impossible to determine what proportion of these advances was prompted by the desire of ingratiating the commanders with the troops, and what to the increased price of all commodities which the influx of the precious metals had created.

[1] Suetonius, Jul. 26. [2] Suetonius, August. 49.
[3] Gronovius de Pecunia Veter. lib. iii. p. 120.

CHAPTER VII.

On the produce of gold and silver from the accession of Augustus to the division of the Roman empire at the end of the fifth century.

THE secure occupation of the imperial dignity by Augustus was followed by a period of tranquillity, little interrupted by the few and slight hostilities which occurred either on the frontiers or in the internal provinces of the empire. The military legions were sufficient to repel the former, and to suppress the latter.

In his early career, Julius Cæsar had found in the public treasury a large mass of gold and silver, which he seized and applied to the purposes of his ambition. It had been long accumulating, and owed its amount to a series of conquests, a length of years, and a course of parsimony, which have been delineated by Lucan in his Pharsalia, where he describes that resolute warrior bursting into the temple of Saturn, where it was deposited, after his first return from his wars in Gaul.

Tunc rupes Tarpeja sonat, magnoque reclusas
Testatur stridore fores: tunc conditus imo
Eruitur templo, multis non tactis ab annis,

Romani census populi, quem Punica bella,
Quem dederat Perses, quem victi præda Philippi,
Quod tibi, Roma, fuga Pyrrhus trepidante reliquit;
Quod te Fabricius regi non vendidit auro;
Quidquid parcorum mores servastis avorum;
Quod dites Asiæ populi misere tributum,
Victorique dedit Minoïa Creta Metello;
Quod Cato longinqua vexit super equora Cypro.
Tunc Orientis opes, captorumque ultima regum,
Quæ Pompejanis prælata est, gaza, triumphis,
Egeritur: tristi spoliantur templa rapina;
Pauperiorque fuit tunc primum Cæsare Roma.

The treasure which Cæsar had thus rudely seized was speedily returned to the treasury, as has been already noticed in this inquiry, and with very large additions. The events which followed his death, though at first partaking of the nature of civil war, do not appear to have diminished the store; and it was amply replenished by his successor Augustus, in part by conquest, but in a great degree by the systematic regularity which he gradually introduced into every department of his extended government, but more especially into the finances.

A succession of favourable events had brought to Rome the accumulated fruits of the labours of mankind during a course of thousands of years. There had been a constant production, and but little consumption, of gold and silver. Although those metals had flowed to Rome as to the centre of the world, yet the arts and industry of the provinces had regularly received

back a portion of them in return for those luxuries and necessaries which the wants of an extended and populous metropolis required. The provinces were thus enabled to continue their contributions to the wealth and voluptuousness of the imperial city, though with gradually diminishing force, during the reigns of the several monarchs who succeeded to the throne of Augustus.

The tributes from the several provinces have been estimated by Gibbon to amount to a sum equivalent to between fifteen and twenty millions of our money, which, though a vast amount, was unequal to the expenditure of the imperial government, which required the imposition of taxes of various descriptions. These may be classed under a name familiar to us by the title of customs and excise, the first of which varied from ten to twelve and a half per cent. on the various goods imported either by land or sea from foreign countries. The excise was an impost on all sales of property made either by auction or in public markets, comprehending the largest sales of houses and estates, as well as those which derive a value only from their infinite variety and their daily consumption. Though the tax was no more than one in the hundred on the amount of the sales, it must have produced a vast sum, notwithstanding the expense and difficulty of the collection, and though

it was the occasion of murmurs even in the popular reign of Augustus, and of still greater complaints and opposition in the reign of his successor, Tiberius.

A further tax also imposed by Augustus was that on legacies and inheritances; a tax which that emperor fixed at a twentieth part of the property of the defunct, and from which there was no exemption, except as regarded the smallest fortunes and the nearest of kin on the side of the father. From the habits of the Roman people this tax was never the occasion of complaint. Gibbon[1] accounts for this acquiescence by saying, "From various causes, the partiality of paternal affection often lost its interest over the stern patriots of the commonwealth and the dissolute nobles of the empire; and if the father bequeathed to his son the fourth part of his estate, he removed all ground of legal complaint."

The tax, even at the lower rate at which it was imposed by Augustus, must in process of time have brought the greater portion of the individual wealth of the community into the public treasury; but when doubled in the reign of Severus, a few generations must have been sufficient to have transferred it from the hands of private persons to the imperial exchequer.

When we consider the sums of money brought

[1] See Gibbon's Decline and Fall, book vi.

into Rome from the conquered and plundered territories, the amount of tributes extorted from the provinces as long as their powers of furnishing them remained, and the vast sums which the taxes we have noticed must have heaped together in the metropolis, we shall find less difficulty in giving credit to what is related of the money collected, expended, and bequeathed, in the age of Augustus, and even up to the time of Constantine. Several of these large sums have been already noticed; to which may be added, that Augustus received in various legacies from deceased friends, according to the recital of Suetonius, £32,291,666 sterling; that Cicero received as presents from his clients and admirers £170,000; and a private person, distinguished by nothing but his wealth, Caius Cæcilius Isiodorus, who died a few years before Augustus, though he had lost a large part of his property in the civil war, left behind him 4116 slaves, 3600 yoke of oxen, 230,057 head of other cattle, and a sum of coin equal to near three millions of our money[1].

Without, however, noticing farther the actual quantity of the precious metals which was collected together in Rome, and from thence dispersed and again collected through the several provinces; it is proper to advance to the subject

[1] Pliny, book xxxiii. c. 10.

of the sources of that subsequent supply of those metals, on which the increase, the stationary continuance, or the diminution of them mainly depended.

In the former part of this inquiry it has been stated that, under the reigns of the earlier Roman emperors, a new system of working the mines in the imperial dominions had been introduced. Instead of farming out the mines to avaricious or negligent renters, the government took the working of them into its own hands, and carried on the several operations under the superintendence of its own officers. If by this first step there was no great gain to the newly installed proprietors, it at least put a stop to that ruinous system by which the best ores alone had been taken away, and those of inferior quality left to impede the operations of the succeeding explorers. It appears also to have introduced more economical practices in the application of the labour of the workmen. This was, however, but a step which was soon followed by another.

It was found no longer possible to conduct the various operations in the mines and in the buildings above ground, by which the roasting, washing, and separating the minerals from the ore were carried on by means of slaves. The government was in possession of the mines, as well as the land above and around them; the occupiers of the soil were a kind of *adscripti*

glebæ, and cultivated it, as in later periods was done in France, under the name of *corvées*, or as is still practised in a few parts of Germany, under the name of *frohndiensten*. These persons were compelled to extend their own services and those of their offspring to the mines, and received the new denomination of *glebæ et metallis adscripti*[1]. The labour imposed upon them was found oppressive and exhausting, and drove many to make their escape, and seek freedom in other countries. In the reign of the Emperor Valens numbers of the miners of Dacia joined the forces of the victorious and invading Goths[2], and it is probable that similar oppression induced others to follow their example. The mining districts suffered in their population by the exactions that were required from them. At first, one half the inhabitants only were compelled to labour in the operations connected with the mines; but as the numbers decreased, a law was made by which all the children of these hereditary miners were required to devote their labour to the mines[3]. Such of them as had gone to the mines in other parts of the empire were ordered to return to their domiciles; and none of them were allowed to go to Sardinia, because it was thought the mines there presented attractions

[1] Codex Theod. de Metallis, lib. vi. sec. 9.

[2] Ammianus, xxxi. l. 5, 6, 7.

[3] Codex Theod. de Metallis, lib. xv.

which might prove detrimental to the working of those in the continental dominions of the empire. Notwithstanding the severe regulations under which these persons held their lands, they were not strictly speaking slaves. They were allowed to dispose of their property if they could find purchasers; but as the new possessors were to be bound to the same services, and were to be placed under the same restrictions, as the former holders, it does not seem probable that it could have been easy to meet with such purchasers. Besides these, who were a kind of feudal tenants, slaves were employed in the imperial mines. They were not indeed foreigners, who had been stolen by piracy and sold, but criminals, who had been condemned by the laws to slavery.

From the earliest period of Roman history, under the consuls and the dictators, labour in the mines had been adopted and practised as a punishment in many cases; but under the emperors it was so much extended, that it became as universally the penalty inflicted on offenders against the laws as under the ancient kings of Egypt. This mode of providing for the working of the mines seems to have been scarcely adequate to the providing of labourers for such of them as were already in operation, and utterly insufficient for opening the new mines which had been acquired by conquest on the banks of the Danube. Hence the emperors

appear to have been induced again to allow of mines being worked by private individuals[1]. It was in this way that, under Trajan, the gold mines of Dacia were worked, stimulated and directed as they were by his *collegium aurariorum.* Valentinian the First proceeded still farther[2]; and allowed to any person who was disposed to undertake such operations to dig for gold and silver, on condition of paying a fixed proportion of the metal so obtained. Thus, Count Felix appears to have had some extensive works in the Pyrenees, the traces of which, as will be hereafter noticed, display an almost royal expenditure[3]. By the last edict the Romans were enabled to open new mines, or to maintain those already in operation with more facility and to a greater extent; and from that, combined with other institutions, some new gold mines were opened in Dalmatia, Istria, and Dacia, in the first centuries after the establishment of the emperors in their despotic power.

As the mines, both belonging to the emperors and to private individuals, required appropriate laws and regulations, as well for the protection of the several persons interested in them, as for

[1] It appears by Strabo, lib. xii., that some traces of the working of mines by private persons were to be seen in the early periods of the republic.

[2] Gebhardi. Hungar. Geschichte, p. i. sec. 7.

[3] Essai sur la Minéralogie des Monts Pyrenées, p. 243.

the collection of the revenue belonging to the crown, various officers were established, of whose peculiar powers and duties we have no very accurate information. They were distinguished by the names of *comes metallorum, comes rerum largitionum,* and *comes orientis;* besides which, there were the *vicarii* and the *rationales,* who were probably the receivers of that part of the produce to which the emperors were entitled.

In general, at the later periods, that indifference which the Romans had displayed at former times regarding the application of science to mining is very apparent, and the operations were left in the hands of men destitute of all theoretic knowledge, and who had learned what little they knew of the art more by following the practices of their predecessors than by any deep investigations or new experiments[1]. The few improvements that were introduced were insufficient to support the mining establishments; and they had to contend with events and circumstances which in process of time completed their extinction. The greater productiveness of the transalpine and Spanish mines, even as early as the time of Strabo, had diminished the extent of workings in the mines of Upper Italy[2]. But the greatest injury, at a later period, was received from the disturbed state of the frontiers,

[1] Reitemeier Geschichte des Bergbaus der Alten, p. 103.
[2] Strabo, book 3.

arising from the irruption of the barbarous tribes which surrounded the empire. The new mines along the borders of the Danube in Dacia, those of Illyria, Dalmatia, and Thrace, were the first to suffer from this cause, which the emperors, either from the weakness of their forces, or the exhausted state of their treasuries, were unable to prevent. The workmen in the mines either fell as captives into the hands of the invaders, and were thus removed from the districts, or[1] they were induced by the sufferings they endured to enlist with the Barbarians, and to augment their means of annoyance to the empire.

By these events some of the mining provinces became gradually depopulated, and in others the workings were by degrees abandoned, as the exhaustion of the products of the more precious minerals had caused the expense of separating them far to exceed the value that could be extracted. This exhaustion of the more valuable contents of the mines had produced the abandonment of those in the east and in Spain; where other nations had gathered the first-fruits, and left to the Romans neither the first, the second, nor the third harvests. From these well-known circumstances, and from the silence of all the writers of a later period concerning the

[1] See Gibbon's Decline and Fall, cap. xxvi. p. 393, where he describes the miners of Thrace conducting the Barbarians to secret magazines of corn and cattle.

operations of the mines, we may safely conclude that, after the third or fourth century, the labour of extracting the precious metals had gradually diminished within the limits of the Roman empire; and that from the fifth century, after the more afflicting irruptions of the Barbarians into the weak and tottering western empire, it had altogether ceased. Almost the latest intimation that is to be found on the subject is the appointment of a *comes metallorum* over the mines of western Illyria in the year 413[1]; but of the extent of his power, or of the revenue derived from the office to himself or his master, we have no information. In the eastern division of the Roman empire some small remains of ancient mining were continued; but the veins had been nearly exhausted, though the workings had not been wholly abandoned, when they fell in the seventh century into the hands of the conquering followers of the new Arabian prophet. The mines in Asia Minor, in Thrace, and in Greece, were the last that the Byzantines possessed. The gold mines of Thrace were in operation in the reign of Valens; but they, as well as those of Illyria, had altogether ceased to be worked with the succeeding two centuries.

The gradual diminution of slavery must have had a great effect on the productiveness of mining

[1] Cod. Theod., lib. 7.

operations. From the earliest history of the world, as soon as mankind had been so far civilised as to spare the lives of prisoners of war by converting them into slaves, the system of slavery had formed a part of the usages of all nations. As navigation extended, slavery had grown with it; and for a long time, especially with the early Greeks, the profits arising from maritime intercourse may be attributed as much to the stealing of human beings, as to the interchange of the productions which the several countries of the world exchanged with each other.

The wars which had immediately preceded the accession of Augustus, and those carried on in the earlier years of his reign, were domestic hostilities in which Romans contended against Romans; and, whatever miseries might be inflicted on the sufferers, it was not the custom to treat the citizens of Rome as slaves to those who had defeated them. The legions of Pompey, when beaten by Julius Cæsar, did not become slaves, neither were those who fought under Brutus and Cassius at Philippi, nor those who contended under Marc Antony against Octavius, when dispersed as an army, sold for slaves to their fellow-citizens.

The Romans were at no time attached to naval occupations, and the commerce they pursued by sea was far from extensive, assiduous, or enterprising. The vessels of war were chiefly

manned by soldiers, and did not, like the fleets of modern times, rear up numbers of men accustomed to the water, who sought for employment at the end of each war in the pursuits of commerce. It does not appear that, like the Greeks and other early navigators, they combined in the same operations the dealing in the luxuries of India, Arabia, and Egypt, with "trading in the persons of men."

In the tranquil reign of Augustus, and under his successors in the imperial dignity, Rome was only anxious to defend her frontiers against the irruptions of the barbarous nations by which she was surrounded. She had no need of a fleet to defend her coasts from maritime invasion, and no distant country over which to extend her conquests that could induce her to maintain a force, so averse to the habits of her people, and so exhausting to her treasury, as a numerous and well equipped naval armament.

We find accordingly that on the accession of Augustus, he kept up but an inconsiderable naval force, consisting of a few small galleys, at Ravenna in the Adriatic, at Misenum in the bay of Naples, and at Frejus in Gaul. These were found sufficient to maintain tranquillity, and to suppress piracy over the whole extent of the Mediterranean sea; whilst a squadron of forty boats on the Euxine were deemed sufficient for protection, and one not larger served to keep

open the communication with, and to convey recruits to, the legions quartered in the British islands.

This contraction of naval intercourse naturally tended to diminish the numbers of that class of slaves which war and commerce had before brought to Rome from Arabia, from Egypt, from Carthage, and other parts of the African continent, as well as from the islands in the Mediterranean sea. Slaves thus became scarce in Rome. They naturally increased in value. They became an object for luxurious gratification, and much too costly to be employed in offices so degrading and so unprofitable as those of removing vast masses of earth and rocks to discover a few scattered particles of gold and silver. As the importation of slaves was checked, it became profitable to breed, rear, and educate them; and the speculation of training up an expeditious and correct amanuensis, a bookkeeper skilled in accounts, a cook capable of producing luxurious delicacies, or a learned tutor for the rising generation, must have presented more powerful inducements than could be offered by any importation of rude and uncultivated savages, who, though possessed of the form and the strength of human beings, were but little better in adroitness, in docility, or in disposition to labour, than the domestic animals.

The inducement to rear and educate slaves

rather than to import them may be inferred from the high price sometimes paid for the purchase of slaves of extraordinary endowments. We find in Pliny[1] that Marcus Scaurus paid for one slave, Daphnes, a grammarian, *sestertiis septigentis*, or about five thousand six hundred and fifty pounds. We are informed that Roscius, the celebrated Roman actor, who was a slave, and who had been the instructor of Cicero in rhetoric and oratory, gained annually more than four thousand pounds sterling. These are solitary instances, and no doubt extraordinary ones; but the chance of producing a single slave of such value, or nearly approaching to it, among hundreds, must have been a powerful reason for rearing rather than importing slaves.

At the most prosperous periods of the Roman empire, though numerous slaves were employed in all the offices of domestic life, in trades, in fabrics, and in agriculture, from whence the latter, when emancipated, gradually rose to the station of adscripti glebæ, there are no instances in the time of the emperors, or in the ages that followed, of their being employed in the degrading and unproductive labour of the mines.

This diminution in the number of slaves, to whose labour the Egyptians, Phœnicians, Carthaginians, and Greeks, were chiefly indebted

[1] Book vii. cap. 39.

for what they obtained of the precious metals, must have contributed with the wars which afflicted the whole Roman empire to that extinction, or decrease nearly approaching to extinction, of the supply of gold and silver, which appears after a long and gradual decay to have taken place towards the end of the fifth century.

CHAPTER VIII.

On the circulation of the precious metals between the reign of Augustus and the dissolution of the Western empire.

Augustus attained supreme and durable power at a period when much of the treasures extorted by the various wars in which the republic had been successful had arrived in his capital. The metallic wealth, which was the fruit of the campaigns of Paulus Æmilius, of Cato, of Pompey, of Julius, of Antony, and of Augustus himself, vast as it may have been, would however have gradually diminished till it disappeared, had no additional supplies been attracted to Rome, to replace what was consumed by the waste of revolving years. Such supplies were required from those various and distant provinces which had first been subdued by and afterwards incorporated with the Roman empire. Their conquerors had stripped the capitals, the temples, the palaces of the monarchs and their treasuries, with the other public edifices, of whatever metallic wealth could be found; but much must have been concealed, and therefore been left in the hands of individuals, which a transient victory and a slight knowledge of

the country could not enable the military to extort, or at least not with the same facility as it might be extracted by the slower but surer operations of the fiscal commissioners in the several provinces, when they became subject to the imperial government. Tributes, as we have seen, were demanded and enforced with severity on all the provinces: many of them were rich as well in the precious metals as in those productions of the soil which form the real wealth of a country. Julius Cæsar describes in his Bello Gallico the flourishing condition and even the opulence of Gaul at the time he invaded that kingdom. The copious stores of metallic wealth may be inferred from the vast treasures amassed at Thoulouse, which, according to Possidonius, on whom Strabo[1] chiefly relies, amounted to fifteen thousand talents in gold and silver bullion. The proportion of one of these metals to the other does not appear; but if it had consisted wholly of silver, it would have amounted to two millions and a half of our money. If it had consisted altogether of gold, it would have amounted, at the proportion which one metal bore to the other at that period, to the enormous sum of thirty millions. It is also stated, that besides the gold and silver collected in Thoulouse, there were in several of the other

[1] Strabo, lib. iv.

cities large accumulations of sacred treasure stored up; probably in the temples. During the long reign of Augustus, regular tribute in silver continued to be drawn to Rome from Gaul; nor do the slight insurrections which occasionally broke out in that country seem to have suspended the transmission of it. Spain, notwithstanding the disturbances which occurred among the Cantabrians and Asturians in the early period of his reign, paid a tribute to Augustus, which was stored up in the two cities he founded—Cæsar Augusta, and Augusta Emerita, now known to us by the more modern names of Saragosa and Merida. Africa, including Egypt, and even Carthage, which had begun to revive since its last fatal struggle with the Roman power, furnished a proportion of its wealth in the form of tribute. That might have been diminished in some degree by the expenses of the wild expedition undertaken by the orders of Augustus, and conducted by Ælius Gallus against the southern Africans. Their country was reported to the emperor to be rich in gold and silver, and he resolved to acquire possession of the treasures either by hostilities or by treaties of amity. With this view, an expedition consisting of ten thousand men was equipped. They were joined by five hundred of the body guard of Herod, king of Judea, and further augmented by one thousand

of the troops of Obodas, king of the Nabathæan Arabs. The latter were commanded by Syllæus, the chief minister of that king, who undertook to act as guide to the expedition. Either from treachery or from ignorance, he led the whole a march of six months to the south, where, under a scorching sun and amidst oceans of shifting sands, almost the whole body perished miserably from hunger, thirst, and disease.

The provinces of Asia added their tribute to the wealth of the capital of Augustus. The territories of Asia Minor, Armenia, Syria, and Judea, with a part of Mesopotamia and Media, were at that time rich and populous; their soil was fertile, the climate genial, and their prosperity had increased by the tranquillity they had recently enjoyed. Their supplies, therefore, could augment the general tribute of the empire, of which they formed a part, without greatly oppressing or degrading the inhabitants. When the description given of Asia by Gibbon is contemplated, we cease to wonder at the removal of the seat of empire to Byzantium by Constantine, as it was natural to found it in the vicinity of those parts of the dominions which could most easily administer to the demands of the treasury.

"The provinces of the east," says Gibbon, "present the contrast of Roman magnificence with Turkish barbarism. The ruins of antiquity

scattered over uncultivated fields, and ascribed by ignorance to the power of magic, scarcely afford a shelter to the oppressed peasant or wandering Arab. Under the reign of the Cæsars, the proper Asia alone contained five hundred populous cities, enriched with all the gifts of nature and adorned with all the refinements of art. Eleven cities of Asia had once disputed the honour of dedicating a temple to Tiberius, and their respective merits were examined by the senate. Four of them were immediately rejected as unequal to the burden; and among these was Laodicea, whose splendour is still displayed in its ruins. Laodicea collected a very considerable revenue from its flocks of sheep, celebrated for the fineness of their wool, and had received, a little before the contest, a legacy of above four hundred thousand pounds by the testament of a generous citizen. If such was the poverty of Laodicea, what must have been the wealth of those cities, whose claim appeared preferable, and particularly of Pergamus, of Smyrna, and of Ephesus, who so long disputed with each other the titular primacy of Asia? The capitals of Syria and Egypt held a still superior rank in the empire: Antioch and Alexandria looked down with disdain on a crowd of dependent cities, and yielded with reluctance to the majesty of Rome itself."

In the time of Augustus, and in the three

succeeding centuries, those were distant provinces, to which must be added such as were then in nearer connexion with the imperial capital. Greece, Illyricum, Dacia, and Pannonia, all contributed, with the islands in the Mediterranean and the Archipelago, to add their tribute to that collected within Italy itself, which, according to the relations of history, contained no less than eleven hundred and ninety-seven cities within its limits.

The revenue extracted from these extensive dominions cannot be accurately defined. It has occupied the labours of learned men, but from the paucity of statistical documents in ancient times and especially before the introduction of the Arabian numerals, the subject must be doubtful; and the result of all inquiries be little better than the conjectures of acuteness.

It has been estimated by several diligent inquirers that the whole revenues of the Roman empire in the time of Augustus amounted to a sum equivalent to forty millions of our money, supposing the Roman pound weight to be equal to the English troy pound of twelve ounces, each ounce being worth five shillings, or the Roman pound of silver being equal in value to three pounds of our present sterling money.

With such a revenue, it does not appear to be improbable that Augustus should have left sufficient money to pay the legacy of two pounds

eight shillings and sixpence, which he is said to have bequeathed to each of the common people, though it might have amounted to four millions five hundred thousand pounds; or that Tiberius should have left in the treasury at his death, as we have already related, twenty-one millions seven hundred and ninety thousand pounds.

It does not appear that under the emperors, the expenditure, denominated in modern time the civil list, or expenses of the court, was accounted for distinct from the general expenses of the government, including the military operations. There was no control on the amount of revenue or of disbursements, except the restriction in the first, on the power of the government to enforce, or of the people to discharge the demands; nor on the last but such as arose from the parsimony or the profusion of the individual who exercised the supreme authority. Accumulation was therefore within the power of those monarchs, if such was their predominant disposition; and the sums before mentioned seem no more disproportionate to this extent of dominion, and to the quantity of the precious metals then in circulation, than what is related of our Henry the seventh, who, in 1507, left in secret places about his palace at Richmond no less than two millions seven hundred thousand pounds in silver money.

Governments which chiefly depend on a military force are compelled to store up large sums of ready money to meet emergencies that may suddenly occur. This was the case with the more provident of the Roman emperors, some of whom owed their elevation, and most of whom were indebted for the retention of it, to having always at command the means of gratifying or preventing the clamours of their troops for pay or for donations. The same necessity existed among the several princes of India, till the overwhelming power of our East India company released the greater part of them from the fear of attacks and incursions, so sudden as to leave no time for defensive preparations being collected. Even in recent times, Buonaparte is said to have kept a great mass of treasure in reserve; and it is commonly believed that up to the present day the military monarch of Prussia, the only one of the European sovereigns supposed to be exposed to sudden attacks, has deemed it necessary to keep in his treasury a large sum in ready money, amounting, according to some accounts, to near two millions sterling[1].

[1] These reports from various quarters, which corroborate each other, though none are strictly official, yet are entitled to credit. It has been said that a part of this treasure has been lately drawn forth to buy up some of the funded debt, and thereby to raise its prices, and enable the government to reduce the interest on the remainder of the debts.

Whether the revenue of Rome amounted to more or less than forty millions, or how nearly it approximated to that sum, is of less importance to this part of the subject of our inquiry, than the mode in which it was brought to the capital, and the means by which it was distributed and put into circulation in the several provinces which were connected with that extended empire.

It is well known that the orders of Augustus were that the tribute should be collected in silver money, and transmitted to the imperial treasury; but it is not credible that such a sum as forty millions annually could have been conveyed from the distant provinces. The roads were indeed extended to the limits of the empire, but they were not calculated for wheel carriages, and rarely used but by horsemen or by the military. The silver must be brought on the backs of horses, and the conveyance of such a quantity of money would make the arrival of horses loaded with silver alone amount to one hundred thousand in each year. Much of the money circulating in the provinces was debased, and the money issued from some of the provincial mints did not contain as much of silver as of baser metal. This circumstance would increase the weight of the sum to be remitted, and consequently require an additional number of horses. The provinces most remote

from the capital, such as Lusitania and Asturia on the one hand, and of Media on the other, are so distant, that a space of one hundred days would be required for a horse to accomplish a journey from them to Rome. Other provinces are certainly much nearer; but even from Thrace or Illyricum the treasure would not arrive in less than thirty days. If the average number of days requisite be estimated at forty, the horses employed in this single labour of transmitting silver money to the seat of government must have reached a number very far exceeding the whole cavalry force of the empire!

We may then safely conclude that the money collected as tribute in the provinces was not remitted to Rome; but whatever the amount of it might be, the greater part was expended in the several provincial governments, and was thus dispersed in the possession of individuals, creating a capital in money, increased by reproduction, so as to form a source from which future imposts, or, as it would be called, tribute, might be regularly extracted. A constant drain upon the provinces would naturally destroy their productiveness; but we know that under the first Roman emperors many of the provinces had advanced to a flourishing condition. Africa with Carthage had so far retrieved their circumstances as to present almost the picture of their pristine power and magnificence. Gaul and

Spain, notwithstanding the large sums which at an early period had been drawn from them, continued to increase in wealth and prosperity up to the final close of the Roman dominion over those countries.

It appears thus fair to conclude that the only metallic tribute transmitted to the capital from the provinces, under the reign of Augustus and of his immediate successors, was that surplus which remained after discharging the expenses of the civil and military departments of the several districts, and such sums as the prefects and other officers nominated by the emperor from among the nobility of the capital could extort by their oppressions, or save by their parsimony.

Whatever the annual amount may have been, in the course of three centuries it would rise to an enormous sum, and furnish sufficient to account—for the plunder found in Rome when it was captured by Alaric and by the African Vandals—for the great expenditure which must have been occasioned by the erection of Byzantium, and—for the sums which were necessary to support those armies which were so feebly opposed to the invading hordes of the barbarous nations that assailed the empire on every frontier.

CHAPTER IX.

On the consumption of gold and silver from the death of Augustus, in the year 14, to the dissolution of the Western Empire, about the year 476 A.D.

At the commencement of this period, the conversion of the precious metals into coin had been extended, and almost universally prevailed; and, though in large payments, there is reason to believe that the coin was still weighed. That might be done, as is done by our modern European bankers, because the operation of determining the amount by weight is easier than by tale, and is besides less exposed to the mistakes which will sometimes occur in counting large numbers of pieces of money, especially when those pieces are of different weights and values; or like the merchants in Spain, who commonly in their transactions weigh a thousand dollars at once, it might be found an economy of time.

It is difficult to fix accurately or even to approximate to that portion of the metal of coin which is destroyed by friction or abrasion.—There will be a great difference in the loss on the respective pieces according to their greater

or less rapid circulation; and any experiments that may be made to ascertain this loss can only lead to doubtful results, unless made upon a very large number of pieces of money. In modern times the practice of issuing bills to represent money causes a large portion of coin to rest inactive in deposit, ready to meet the demand that may be made. In ancient times the money was mostly in the hands of the several governments, who only drew it forth in some pressing emergencies. If it be difficult to calculate the portion now existing in the coffers of our banks and bankers, it is still more difficult to estimate what portion of ancient coin was in a similar state of inactivity in the treasuries of the several ancient governments.

It is found that the loss by friction is very far greater on the small than on the large pieces of coin[1]; thus the loss on our present sixpenny pieces in the same space of time is found to be more than three times as great as that on the half-crowns, and nearly double as great as on the shillings. With regard to the ancients, we are in utter ignorance of the proportion which the larger and smaller coins bore to each other. The loss by abrasion too is found to be much greater on silver than on gold coins; and of the proportion of the latter which was circulated in

[1] See Appendix, No. 1.

ancient times to that of the former, we have no means of judging; for their relative value varied frequently in the space of time we are contemplating; gold being sometimes of not more than nine times the value of silver, and at other times twelve or thirteen times that value. If the relative values of the two metals had remained constantly the same, supposing that of gold to have been ten times the value of silver, it would by no means be a fair inference that there was ten times the weight of silver in the form of circulating coin that there was of gold. The two metals may be demanded for other purposes than that of coin, and the superior adaptability of one for such purposes may have determined the relative value of one to the other, in as great or a greater degree than the demand of it for coin.

The gold and silver coins circulating under the reigns of the successive Roman emperors were thicker in proportion to their weight than our modern coin, and, consequently, presenting a less portion of surface to abrasion, were liable to less loss in the wear; but, on the other hand, we know that, in the course of the four or five centuries we are considering, the smaller coins were constantly gaining in the proportion which they bore to the larger ones in the time of Augustus. This alteration may have more than counterbalanced the less loss occasioned by the greater thickness of the pieces.

During the period between the years twenty-five and four hundred and seventy-six from our era, whilst the declension of the mines was proceeding, and the produce from them annually diminishing, till it became quite extinct, it is highly probable that some addition to the coined gold and silver was made from that portion of those metals which had been appropriated to pomp, magnificence, or convenience.

There seems no reason for estimating the gold and silver in the possession of private individuals, in the form of utensils and ornaments, to have been large, or at least to have borne nearly the same proportion to that which was stamped into money, as exists in modern times in Europe between the two kinds of metallic wealth. The Romans seem to have lived much in public, and to have had very imperfect notions of the enjoyments of domestic life. The object of those who enjoyed great wealth was to attain celebrity and power by means of the populace: the display of magnificence in their dwellings and furniture would not have been effective for their chief pursuit. Hence, whilst profuse in that expenditure which could be seen by the public, they were parsimonious in all their private, personal, and domestic arrangements. At an early period their houses were of wood, and even in the time of Augustus covered with shingles. They had neither chimneys to convey away the smoke, nor

glass windows to admit the light and exclude the cold. An open place in the centre of the roof of the house admitted the rain that fell into a place called *impluvium* or *compluvium*, and the light was admitted by the same opening. Even in the villas, where the opulent Romans displayed their greatest domestic luxuries, the barns, stables, wine and oil storehouses, granaries, and fruit rooms, with the sleeping places for the agricultural slaves, formed a part of the building in which the proprietor resided, and on the top of which was his supping apartment, where he could enjoy the prospect of the surrounding country, without feeling the annoyances which must have affected his senses of smelling and hearing from his stores and his slaves and working cattle.

The clothing of even the best families was fabricated in their own houses. The mistress of a family with the female servants were employed in spinning and weaving, and conducted the operations in the chief apartment *(in medio ædium)*, according to Livy, book i. cap. 57. This kind of industry was thought to be so necessary, that to inculcate it most securely, one part of every marriage procession consisted of females carrying a distaff, a spindle, and wool, to intimate to the bride what was to be her future duty. Augustus himself is said by Suetonius to have worn nothing for his domestic

dress but what was manufactured by his wife, his sister, his daughter, and his nieces. The clothing was chiefly of wool; for though linen was made, and a robe of it *(vestis lintea)* was much valued, it was by no means commonly worn. The only furniture, exclusive of the dishes and vessels for drinking, was a kind of extended couch, which served the purpose both of sitting and sleeping on.

With this domestic plainness and frugality may be contrasted the extravagance which was displayed in the public appearance of the more eminent Romans. Their carriages, a kind of sedan chair, had feet sometimes of silver or of gold, on which to stand when the slaves rested from carrying them. The carriages drawn by horses in some of their religious processions were splendidly ornamented with gold, silver, and ivory, and on some occasions the horses were shod with silver, and the bits and ornaments of the bridle were of silver or gold enriched with precious stones. The temples, the altars, and the places of public assembly were expensively ornamented; but we can find but few traces, and those confined to a small number of persons, of any accumulation of valuable domestic furniture or ornaments in the hands of private individuals. Besides, the structure of society in Rome was such as to exclude from probability the expectation that any large portion

of gold and silver could be possessed by private families. There were none of those gradations of rank and property in Rome which are to be found at this time commonly in Europe, but eminently in Great Britain. There was scarcely any middle class of society, such as with us are the possessors of the chief portion of the stock of accumulated wealth. The public was composed of a few patrician families, who, though some of them were poor, held the greater portion both of land and money. The great mass of the inhabitants were either labourers on their own contracted spots of land, or that rented either for money or produce from the great proprietors. With these were mingled many slaves, collected from various and often distant nations, who were as transferable and commonly as destitute of property as the flocks they tended or the soil they tilled.

The higher classes who were aiming at power through popularity, at first with the mob, and at a later period with the soldiers, were induced by the circumstances in which they found themselves to attend more to public display than to private comfort. From their situation it became necessary to their success, as public men, that they should have a reserve stock ready to be distributed whenever the distribution of it might serve the purposes of ambition. Domestic utensils or personal ornaments would be less

suitable to occasions of this kind than coined money, which could, from the minute division of which it is susceptible, be distributed with facility and equality.

These bribes, under the name of *congiaria*, were dispersed with no parsimonious hand during the reign of Augustus, by his will at his death, and by the intriguers for power and popularity in the ages that succeeded his. A few notices collected from various authorities will show to what an extent this kind of bribery was carried among the Romans, and will also tend to prove, that instead of hoarding the precious metals in the shape of statues, vases, cups, dishes, and personal ornaments, the great possessors of them must have had the strongest inducements to prefer keeping them in the shape of coined money.

We are informed, that Augustus frequently gave *congiaria* sometimes of 30 *nummi*, or 4*s.* 10$\frac{3}{4}$*d.*, sometimes of 40 *nummi*, or 6*s.* 6*d.*, and sometimes of 250 *nummi*, or 2*l.* 2*s.* 1*d.*, to the whole population, not omitting the children; though on former occasions it had not been customary to include any under eleven years of age[1]. The same emperor left by his will 2*l.* 8*s.* 5*d.* to each of the common men[2].

[1] Sueton. in Augusto, cap. 41.

[2] Dion Cassius, lib. 56.

Another author affirms, that he left to the people of Rome 322,916*l.*, and to the tribes 28,255*l.*[1] It is, however, possible these two accounts may refer to the same legacy. Tiberius was notorious for his parsimony, and yet on one occasion he gave to the people a *congiarium* of 300 *nummi*, or 2*l.* 8*s.* 6*d.*, each[2]; and on another, after an extensive fire, relieved the sufferers by gifts amounting to 807,291*l.* 13*s.*[3] The covetous habit of this emperor was so great, that he commonly allowed to his attendants only their food; but on one occasion he divided them into three classes, and presented to each of the first 4843*l.* 15*s.*, to each of the second 3229*l.* 3*s.* 4*d.*, and to each of the third 1614*l.* 11*s.* 8*d.* as gratuities[4].

In the succession of the emperors we find continued instances of these donations. Caligula, who attained imperial power about the year thirty-eight of our era, gave to each Roman 1*l.* 18*s.* 9*d.*, and paid also a legacy left to them by his predecessor Tiberius of one thousand one hundred and twenty-five myriads of drachmas, or 363,281*l.* 5*s.*[5] Nero, about twelve years later, presented a *congiarium* of 400 *nummi*, or

[1] Sueton. in Aug. cap. 41.
[2] Sueton. in Tiberio, cap. 20.
[3] Ibid. cap. 20.
[4] Ibid. cap. 20.
[5] Dio, lib. 59.

3*l.* 4*s.* 7*d.*[1] Nerva, about the year ninety-six, gave a donation to the distressed citizens, but in land, which is valued at 484,375*l.*, of our money[2]. Adrian, twenty-one years later, on his succeeding to the throne of Trajan, gave a *congiarium* of double that of any former emperor; and he asserted that he had given to the people and soldiers the enormous sum of 3,229,166*l.* to procure the nomination of Commodus as his successor on the throne, all of which had been lost by Commodus dying before Adrian[3]. Antoninus, who was nominated emperor in 138, gave a still larger donation of eight aurei, or 6*l.* 9*s.* 2*d.*, to each person[4]; but in the subsequent part of his tranquil and beneficent reign seems to have had no necessity for extraordinary donations to secure the confidence and obedience of the people. Commodus, who succeeded to the throne in 179, gave a donation of 725 *denarii*, or 23*l.* 8*s.* 2*d.*[5]; and Severus, who became emperor in 194, gave such a *congiarium* as amounted to 1,614,583*l.* 6*s.* in our money[6].

[1] Sueton. in Nerone, cap. 10.
[2] Dio in Nerva.
[3] Spartian in Adriano.
[4] Dio in Antonino.
[5] Lampridius in Commodo.
[6] Dio in Severo.

Similar specimens of enormous expenditure in procuring votes for different public offices, as well as for acting as spies on public bodies or individuals, are to be found in the ancient authors. Thus Milo, who proposed himself for consul, gave to each of the voters 32*l.* 8*s.* 10*d.*[1] Sabinus Nymphidius promised to each soldier of the provincial legions who would support the choice of Galba as emperor 40*l.* 7*s.* 3*d.*[2] Claudius promised to each soldier 113*l.* for his vote[3], and Julian 201*l.* 16*s.*[4] Otho promised to the assassins of Galba a reward of 403*l.* 12*s.* each, and paid them in advance 80*l.* 14*s.*[5]; and bribed one of his servants with 8072*l.* 18*s.*[6] The bribes given in the courts of law to influence the decisions were enormous, and there is reason to believe of frequent and usual occurrence.

This large expenditure, and the power of

[1] Asconius Pedianus.
[2] Plutarch in Galba.
[3] Philippus, lib. iii.
[4] Dio.
[5] Sueton. in Othone.
[6] Sallust. In stating the amount of the sums in the text the estimation of Arbuthnot in his tables of ancient coins has been implicitly adopted. If subsequent writers have shown that all of them are not minutely accurate, yet nothing has tended to prove any such deviation from exactness as can affect the view intended to be exhibited here, of the large masses of coin which must have been accumulated in the hands of a few of the most wealthy families.

making it, was confined to a very few families. According to Cicero, there were not two thousand persons who possessed property[1] in his day, when the city and its immediate suburbs is estimated to have contained one million two hundred thousand inhabitants. In that age all the patricians must be considered as citizens, though some were despatched to govern the provinces or to command the armies, and by those appointments increase the mass of wealth in the hands of their own peculiar and exclusive caste.

The great body of the citizens could retain neither gold nor silver, either in the form of coin or in that of utensils or ornaments. Their situation, as admirably described by Gibbon, forbids the adoption of the opinion that any quantity of the precious metals could be accumulated in their hands. "In populous cities, which are the seat of commerce and manufactures, the middle ranks of inhabitants, who derive their subsistence from the dexterity or labour of their hands, are commonly the most public, the most useful, and, in that sense, the most respectable part of the community. But the plebeians of Rome, who disdained such sedentary and servile arts, had been oppressed from the earliest times by the weight of debt and usury; and the husband-

[1] Non esse in civitate duo millia hominum qui rem haberent. Cicero Offic. ii. 21.

man during the term of his military service, was obliged to abandon the cultivation of his farm. The lands of Italy, which had been originally divided among the families of free and indigent proprietors, were insensibly purchased or usurped by the avarice of the nobles; and in the age which preceded the fall of the republic, it was computed that only two thousand were possessed of any independent substance. Yet as long as the people bestowed by their suffrages, the honours of the state, the command of legions, and the administration of wealthy provinces, their conscious pride alleviated in some measure the hardships of poverty; and their wants were seasonably supplied by the ambitious liberality of the candidates who aspired to secure a venal majority in the thirty-five tribes, or the hundred and ninety-three centuries, of Rome. But when the prodigal commons had imprudently alienated not only the *use*, but the inheritance of power, they sank, under the reign of the Cæsars, into a vile and wretched populace, which must, in a few generations, have been totally extinguished, if it had not been continually recruited by the manumission of slaves and the influx of strangers."

It does not fall immediately into the design of this inquiry to examine further than is here done the structure of society, such as it existed in the ancient world, whether under the form of

a monarchy or of a democracy. It would be easy to show that the rate of interest, commonly one per cent. per month, and frequently much higher, must have drawn the greater part of the property of the community into the hands of the few, who were sufficiently dexterous to obtain the command of armies and the government of provinces, and thereby to amass a large share of wealth. This high rate of the interest of money, with the care taken to supply the necessaries of life to the idle and heedless citizens of Rome, may account for the riches of a few individuals, and also serve to show that the mass of gold and silver in the time of Augustus was not so large as not to be dispersed or consumed in the period which followed; which, in the view here taken, is extended to the falling to pieces of the western empire, at the latter end of the fifth century.

We may, then, venture to conclude that whilst the coined money in the Roman empire was continually wearing away by friction, and no supplies of the precious metals to replace it were to be drawn from the exhausted or dilapidated mines, there could be very little addition made to its current money, by converting the ornaments and utensils of the few wealthy families into gold or silver coin.

It has been supposed that in the present day, in this country, the quantity of gold and silver

in actual existence, including utensils, ornaments, jewelry, trinkets and watches, is three or four times as great as the value of those metals which exists in the form of money. In case circumstances should arise to induce the conversion of plate into money, there would be a resource which could furnish a supply: but in the Roman empire, the plate and jewels of two thousand wealthy families would have been but a feeble aid to the money circulating in that powerful empire, which comprehended within its limits the most populous and extensive parts of the known world.

The cities of Herculaneum and Pompeii were buried by an irruption of Vesuvius about the year 79, when the Roman power and prosperity had shown no visible tokens of that decline which began a few years afterwards. The latter was one of the most industrious and populous cities on the coast of Italy. Within the last century their ruins have been examined. Pompeii was covered with ashes and cinders, rather than with lava, and the investigators have been more successful in their examinations there than at Herculaneum. In some of the houses skeletons of the inhabitants have been discovered, in all, domestic utensils and personal ornaments. But among the utensils none have been found either of gold or of silver; but those for which in our day silver is almost exclusively adopted by the

middle class of persons, are composed of iron or brass. These antiquities give a correct idea of the domestic arrangements of the people, such as they were at the period when the catastrophe occurred, and they show most clearly that gold and silver were not to be found in the dwellings of the inhabitants; though the size of the houses, the paintings, the statues, the books, and other objects, sufficiently prove that the proprietors of them were persons at least in easy circumstances. From their durable nature, if gold and silver had been in these houses at the time of the calamity, they would have been found there, as the iron and bronze have been, of which their spoons and forks were made; and which retain their original shape after a lapse of more than seventeen hundred years.

Had the same calamity visited one of the richer provincial cities of any part of Europe, but especially of England, Holland, or France, every house, whatever length of time might have elapsed, would, at being opened, have displayed a greater or less quantity of the precious metals. An examination of this kind is a more convincing testimony than any of the numerous and vague relations which historians have handed down; and we may safely infer from it, what has been before remarked, that among the Romans those precious metals which form a portion of every family's stock of furniture were so rarely in use

among them as to afford but insufficient resources from whence to replace that part of the coined money which was annually consumed.

The irruptions of the barbarous nations, who, during the latter part of this period, broke into the boundaries of the Roman empire, would naturally lead them to seize on the precious metals wherever they could discover them. The temples and other public edifices would be deprived of their most costly ornaments. Such ornaments would be valued by the barbarians only for the means they afforded to voluptuous gratifications. The gold and silver when in masses would be useless to those rude people; they would soon be converted into the more transferable shape of coin. It is impossible now to form any estimate of the addition that would arise from this source to the quantity of money then in circulation. The circumstances of the world in that period would not lead us to estimate this addition very high.

The paganism of the Roman empire had given way to christianity. Those who had adopted the new religion would treat with no respect the objects of the devotion of those they had supplanted; but as soon as they possessed power they became, though by gradual steps, as eager to amass the precious metals to decorate their religious services as the pagans themselves. The churches were as profusely supplied with

images, crosses, chalices and flagons, as the temples in the preceding age. The barbarians who at first brought with them a kind of paganism, but differing from that which the Romans had derived from the Greeks, were induced to embrace the christian faith. Though on some mysterious points they differed from the prevailing or orthodox church, who branded them with the epithet of heretics, they were quite as deeply imbued with that reverence for Christ, for his mother and the saints, which led them to venerate with superstitious awe the images that represented them, and the gold and silver utensils which were dedicated to their worship.

Alaric, the Gothic monarch, when he invaded Italy, encouraged his troops boldly to seize the rewards of valour, and to enrich themselves with the spoils of a rich but effeminate people, but he ordered them to respect the churches of St. Peter and St. Paul, and to treat them as holy and inviolable sanctuaries.

When the Franks took from the Goths the palace of Narbonne, many curious and costly ornaments of pure gold were found, enriched with jewels. Sixty cups or chalices, fifteen pattens or plates, for the use of the communion; twenty boxes or cases to hold the books of the gospels: this consecrated wealth was distributed by the son of Clovis among the churches of his dominions. The Goths before were in posses-

sion of the famous *missorium*, or great dish, for the service of the table, of massy gold, of the weight of five hundred pounds, and of far superior value, from the precious stones, the exquisite workmanship, and the tradition that it had been presented by a Roman patrician to Torismond, one of their former kings. This celebrated piece of furniture was found in Spain by the Arabs, who destroyed the Gothic monarchy in that country, and, with other treasures of greater value, was probably converted into coin by the Mahometan chiefs who had established their dominion in the peninsula[1].

One event in the period under consideration must have had a great effect, if not on the quantity, yet on the locality of the circulation of the gold and silver coin. The founding of the city of Byzantium, the modern Constantinople, and making it the central point of the Roman empire, would naturally attract thither the metallic as well as the other treasures of the world. It was nearer to Egypt, which, up to the time of the invasion of Africa by the Vandals, and the existence of their transitory kingdom, had been one of the chief sources of the revenue of the empire. It was nearer to the rich and then populous provinces of Asia, and well situated to watch the movements of the Persians, the only

[1] See Gibbon, cap. xxxi. vol. 5, page 337, edit. 1807.

regular power which created any great anxiety in the mind of Constantine; for the Goths, the Vandals, the Alani, the Alemani, the Heruli, the Suevi, and other of those denominated barbarous nations, were considered by him as too insignificant to create much uneasiness, though in a few centuries they grew sufficiently powerful to threaten and to occupy both Rome and Constantinople, and to divide among them the most extensive provinces of the magnificent but declining empire. Though the founding of Constantinople may have tended to draw the gold and silver of the world to the eastern side of Europe, and though it thereby weakened the industry and productive power of Italy, it left Gaul, Spain, and the other countries of western Europe less liable to that drain of the precious metals, which the greater accessibility of Rome had, as long as her unchecked power continued, operated to their disadvantage.

This removal of the seat of empire, whatever other effect it may have produced, does not appear to have had any on the increase or decrease of the precious metals. It neither opened new mines in Africa or Asia, nor kept those in operation which in Thrace and Illyria had yielded copious supplies. Constantine, we are informed by Gibbon[1], but on authority which

[1] Decline and Fall, cap. xvii. p. 18.

may be admitted with hesitation, appropriated sixty thousand pounds' weight of gold, or two millions five hundred thousand pounds of our money, to the construction of the walls, the porticos, and the aqueducts of his new imperial capital, and drew to it some of the patrician families of Rome by extensive grants of land in the Asiatic provinces, on the easy condition of maintaining in the city the splendid palaces which he constructed for their residence. By such and correspondent measures the new city became rich and populous, and the surrounding district cultivated and productive, but it was at the expense of Rome and of Italy. Montesquieu remarks, "Although Rome itself was not nearly so large as it is at the present day, its suburbs were prodigiously extended. Italy, full of houses of enjoyment, was, properly speaking, the garden only of the city: the labourers of Rome were in Sicily, in Egypt, in Africa, and her gardeners in Italy." The lands were cultivated not by the Roman citizens but by their slaves; but when the seat of empire was established in the east, Rome may be said to have been transplanted to Byzantium. The grandees carried with them their slaves, or in other words, almost the whole population, and Italy was thus left destitute of inhabitants. In order that the new city might be inferior in no point to the ancient capital, the wheat of Egypt

was compelled to be conveyed to Constantinople, and that of the rest of Africa to Rome [1]."

The tribute of the provinces which in the time of Pliny had been directed to be transmitted in silver, was ordered to be collected and forwarded in gold, or only in such silver money as was of the imperial coinage.

It has been seen that the treasure which Rome by her conquests had drawn from Macedonia had been so great, as to make the levying of taxes unnecessary during several generations, and that the treasures of the Ptolemies, and the continued supplies of the precious metals which for some time after had continued to flow into Rome from Egypt, had increased the quantity of money, and had raised the price of all other commodities. But in the three or four centuries between the reign of Augustus and the establishing of Constantinople, money had become scarcer, and the emperor, instead of lowering the taxes as the prices of commodities declined, or, which is the same, as the value of money had increased, raised them to a height very far beyond the point they had ever reached before. In addition to the taxes on articles of consumption which had been before levied, another was imposed which partook of the nature of a tax upon property and a capitation tax. This

[1] Montesquieu, Grandeur et Decadence des Romains, cap. xvii.

was not a fixed impost, but varied in amount according to the wants or the will of the reigning emperor. The general estimate of the supplies was proportioned to the real and imaginary demands of the state; but as often as the expense exceeded the revenue, or the revenue fell short of the computation, an additional tax was imposed on the people. A regular survey was made of the value of the property every fifteen years. The lands were measured by surveyors, who were sent into the provinces; their nature, whether arable or pasture, or vineyards or woods, was distinctly reported, and an estimate made of their common value from the average produce of five years. The numbers of slaves and cattle constituted an essential part of the report. An oath was administered to the proprietors, which bound them to disclose the true state of their affairs; and their attempts to prevaricate, or elude the intention of the legislator, were severely watched, and punished as a capital offence, which included the double crime of treason and sacrilege.

The amount of this tax cannot now be known, except as regarded the province of Gaul; but it was such as tended to devastate and depopulate many parts of the empire. According to Gibbon (cap. xxvii.), "The rapacious ministers of Constantius had exhausted the wealth of

Gaul by exacting twenty-five pieces of gold[1] for the annual tribute of every head. The humane policy of his successor reduced the capitation to seven pieces. A moderate proportion between these opposite extremes of extravagant oppression and of transient indulgence may therefore be fixed at sixteen pieces of gold, or about £9 sterling, the common standard, perhaps, of the impositions of Gaul."

Though this task was imposed according to the number of inhabitants, it seems only to have comprehended the heads of families, and did not include the slaves or feudal tenants, which, as the land was chiefly cultivated by them, must have formed a great majority of the inhabitants of each province. The exactions of Constantine upon the province of Gaul have been estimated by Gibbon, who adopted his data from the Abbé du Bos, at "seven millions sterling, which were reduced to two millions by the humanity or the wisdom of Julian."

[1] The *aureus*, or piece of gold, as calculated by Graves, and sanctioned by Gibbon, was equal in value to the fifth part of a pound of silver. The pound of gold, which had been originally coined into forty pieces, was, in the time of Constantine and his successors, formed into seventy-two pieces. The Roman pound of gold contained 5256 grains; the English pound contains 5760 grains. If the Roman pound of gold be estimated to be worth forty pounds of our money, the *aureus* may be taken as somewhat more than eleven shillings.—See Gibbon, cap. xxvii. p. 89.

"Whatever may have been the amount of taxes imposed on the several divisions of the Roman Empire, whether they were more or less grievous than those extracted from Gaul, they at length evidently produced a general and increasing distress in every province of the dominion. The agriculture of the Roman provinces was insensibly ruined, and, in the progress of despotism, which tends to disappoint its own purpose, the emperors were obliged to derive some merit from the forgiveness of debts, or the remission of tributes, which their subjects were utterly incapable of paying. The fertile and happy province of Campania, the scene of the early victories and of the delicious retirements of the citizens of Rome, extended between the sea and the Apennine, from the Tyber to the Silarus. Within sixty years after the death of Constantine, and on the evidence of an actual survey, an exemption was granted in favour of three hundred and thirty thousand English acres of desert and uncultivated land, which amounted to one-eighth of the whole surface of the province. As the footsteps of the Barbarians had not yet been seen in Italy, the cause of this amazing desolation, which is recorded in the laws, can be ascribed only to the administration of the Roman emperors." P. 87.

The conclusion to which Gibbon and other writers have arrived ought not to be received

without some limitation, or at least some examination. The administration of the Roman emperors may have been one cause of the amazing desolation which had become so obvious before the footsteps of the Barbarians had been seen in Italy; but another cause had been operating, which, from its secrecy, or its almost imperceptible progress, may have equally escaped the observation of the government, and the notice of the historians of their deeds. While the production of the precious metals from the mines had ceased, and the countries near to the mines had poured the whole, or the greatest part, of their ancient and long accumulation into the universal empire, there would be a consumption, a decay of the quantity of gold and silver in constant progress, which, by lowering the metallic price of all other commodities, would check that industry by which alone a country can continue to prosper.

This cause it is indeed difficult to weigh, and yet in the period now under our review, it must have operated with prodigious force. It may not therefore be improper to attempt an estimation of the effect that must have been produced by it.

If we could obtain any certain data, the difficulty would be much diminished. If we could ascertain the quantity of gold and silver coin in circulation, at any precise period, we might cal-

culate the gradual wear of it, and thus see the effect produced on the mass in a long period. But as this cannot be obtained, it may be permitted to have recourse to an assumption of such quantity, and calculating from that the wear by friction, try to approximate to the difference between the current coin in the age of Augustus: the period of the greatest prosperity of the Roman dominions, and that of the dissolution of the western empire;—a time which had been preceded and was followed by the deepest distress and degradation.

The gradual diminution in the weight of the chief gold coin, the *aureus*, most probably arose from some sensible decrease in the quantity of the metal of which it consisted. In the time of Augustus, as has been before remarked, it was the fortieth part of a pound of gold, and consequently was equivalent to twenty shillings of our present money. In the reign of Nero, about seventy or eighty years later, it was only the forty-fifth part of a pound, and consequently equivalent to seventeen shillings and tenpence; but in the reign of Constantine, two hundred and seventy or eighty years after, it had diminished to a seventy-second part of the pound, and consequently was worth no more than between eleven and twelve shillings; whether this declension in the intrinsic value of the piece arose from a diminution in the whole weight of

it, or from the deficient weight being made up from a greater proportion of alloy, is a matter of doubt, though the latter seems the most probable supposition.

We find in Suetonius, that Vespasian, when he succeeded to the imperial dignity, asserted that a sum equivalent to £322,916,600[1] was necessary to support the commonwealth. This amount could not have reference either to the annual revenue or to the accumulation in the public treasury; for the produce of neither of those departments at any period could have yielded so large a sum. It is not, however, unreasonable to suppose that it bore a reference to the whole mass of coined money at that time known, or believed, or supposed to be in circulation within the boundaries of the republic. Assuming, then, that this sum was nearly the amount of the whole stock of current money, we may, without relying on its precise accuracy, venture to make use of it as the foundation of an estimate of the loss created by abrasion in the course of the period we have brought under consideration. Vespasian began his reign and uttered the opinion we have stated

[1] "Quadringenties millies (scilicet H. S. Vespasianus) statim initio sui principatus opus esse professus est, ut republica stare posset."—Sueton. in Vespasiano, cap. xvi.

about two years after the death of Nero. In the time of Nero, the *aureus* had declined in value, from the reign of Augustus, at the rate of somewhat more than ten per cent., and we now assume that the coined money, in this period, had decreased in nearly the same proportion. With these views, we should calculate the quantity of money in the time of Augustus to have been about £358,000,000.

From the far greater proportion of the money of a country which was constantly accumulated in hoards in ancient than in the present times, we must calculate the loss much less than experiments made in the present day would show to be sustained in modern European gold and silver coins.

We will estimate, then, the loss from wear, on the whole quantity of money, to be at the rate of one part in three hundred and sixty annually. Thus a piece of gold or silver coin weighing three hundred and sixty grains, would lose in a single year one grain, or a thirty-sixth part in ten years.

The following table will show what, upon such supposition, would be the decrease in the quantity of gold and silver money in the Roman empire, between the death of Augustus in the year 14, and the termination of the western empire in the years between 470 and 490.

We suppose that, in the year 14, the gold and silver amounted to	£358,000,000
Deducting 10 per cent for wear, there would be,	
In the year 50	322,200,000
86	287,980,000
122	259,182,000
158	233,263,800
194	209,937,420
230	181,943,678
266	163,749,311
302	147,374,380
338	132,636,942
374	119,373,248
410	107,435,924
446	96,692,332
482	87,033,099

It has before been shown that the whole supplies from the mines of gold and silver had not ceased in the reign of Augustus. Some few of them continued to be worked later, though they yielded but trifling products. Those products would, however, in the earlier years of the period comprehended in the table, have the effect of lessening the decrease, though, when added to the general mass of metallic money, they would become subject to the same rate of decrease.

The fluctuation in the value of the *aureus*, which is before noticed, will in some degree be illustrated by this table, though that fluctuation may not exactly correspond with the scale of the decrease of the quantity of money in circulation. That piece of money in the reign of Augustus, when the whole quantity of money is sup-

posed to have amounted to near £358,000,000, was worth twenty of our shillings; but in the time of Nero, when the whole quantity of money was reduced to about £300,000,000, it was worth about seventeen shillings and ten-pence. The quantity of coin had thus diminished one-seventh, and the value of the aureus only decreased a little more than a tenth; but if we suppose in that period some produce to have been extracted from the mines which had continued in operation, it may tend to bring nearer together the proportion of money and the value of the aureus.

Constantine began his reign about the year 304, when by the table the decrease of coin had reached nearly three-fifths. The aureus had not diminished in equal value, having scarcely fallen one-half. We are by no means disposed to deem this any certain criterion, nor should we deem it a fair one if the coincidence were still more striking than it appears. That coincidence too must have been affected by other circumstances. The mines continued to produce some of the precious metals even below the reign of Constantine. The tribute too from Egypt and Carthage, both in corn and gold, was considerable up to the time that the Vandals established their dominion in Africa.

During the greater part of the period, the practice of debasing the coin had been extending.

In the cabinets of medals are to be seen many cased with a thin coat of silver over copper or brass[1]. If this practice did not begin with Commodus, which has been asserted, it prevailed whilst Didius Julianus, who bought the imperial dignity at an auction a few years after him, retained his transient power. The money of Caracalla is found to have more than half of it of base metal, that of Alexander Severus contains two-thirds of copper, and that coined under Gallien exhibits only brass washed with silver[2]. The debasing of the coin seems indeed to have been most extensively adopted as a resource by the worst of the monarchs, but may still be considered as evidence of a decrease of the precious metals. This debasement of the coin serves in some measure to account for the increase of pay to the soldiers whilst the consumption of the precious metals was proceeding. Thus Macresius wrote to the senate, that the augmentation of the pay to the troops made by Caracalla amounted to seventy millions of drachmæ, or about one million eight hundred thousand pounds[3].

The zeal of M. Væscovali and of Mr. Wm.

[1] See la science des medailles du Père Joubert. Paris, 1750. Page 59.

[2] Savotte, part 2, cap. 12, and Journal des Savans du 28 Juillet, 1681, sur une découverte de 5000 medailles.

[3] Montesquieu, Grandeur et Décadence des Romains, c. 16.

Banks has recently furnished the world with an edict containing a very copious tariff of prices which have been discovered at two distant parts of the Roman empire. These the learned Colonel Leake has ascertained to have been of the reign of the Emperor Diocletian in the year 302, which followed a few years after the great debasement of the coin under the reigns of Caracalla, Alexander Severus, and Gallien.

The year 301 had been one of remarkable dearth, and probably that circumstance might have combined with the debasement of the coin to create the tariff, and to raise the prices of all commodities to the enormous height at which the edict has fixed the maximum. How far the prices were caused by the dearth, or how far by the debasement, it is now impossible to determine.

The nominal prices—taking the denarius at the original value of that coin when it contained sixty-five grains or the seventh part of an ounce of pure silver, or seven-pence three farthings of our money, if our shillings were, as they ought to be, the sixty-second part of a pound, and not, as they are, the sixty-sixth part of that weight —we find to be as follows.

Oil of the first quality *(olei flos)* .	℔ pint	£0	17 6
Oil of the second quality . . .		0	10 6
Oil of coleseed		0	3 6

Honey, the best	℔ pint	£0	17	6
Ditto, second quality		0	8	9
Pork	℔ Italian ℔	0	10	6
Beef		0	7	0
Goats' flesh or mutton		0	7	0
A fattened cock pheasant	℔ head	7	19	0
A wild cock pheasant		4	16	0
A fat goose		6	2	0
A goose not fattened		3	1	0
Wild-boars' flesh	℔ Roman ℔	0	8	9
Stags' flesh		0	6	7
Flesh of the buck, doe, or roe		0	6	7
Butter		0	7	6
Sea-fish of the best quality, from deep water	℔ ℔	0	10	6
Second-rate fish		0	7	6
Best river-fish		0	5	3
Second-rate river-fish		0	3	9
Dry cheese		0	5	3
Artichokes of the larger sort	five for	0	6	6
Lettuces, the best	five for	0	2	5
Ditto, second quality	ten for	0	2	5
Cauliflowers, the best	five for	0	2	5
Ditto, second-rate	ten for	0	2	5
Green onions, the best	twenty-five for	0	2	5
Ditto, second-rate	fifty for	0	2	5
Cucumbers, the best	ten for	0	2	5
Ditto, second quality	twenty for	0	2	5
Melons, large	two for	0	2	5
Ditto, second-rate	four for	0	2	5
Apples	forty for	0	2	5
Pomegranates, the largest	ten for	0	4	10
Ditto, the smaller	twenty for	0	4	10
A citron of the largest size		0	16	0
One of a second rate		0	10	6

Dried figs	twenty-five for	£0	2	5
Plums from the mountains of Damascus,	eight for	0	2	5
Quinces	ten for	0	2	5
Ditto, second-rate	twenty for	0	2	5
Agricultural labourers	℔ day	0	15	10
Stone-mason		1	11	8
Labourer of inside work in houses		1	11	8
Worker in marble or mosaic		1	18	2
Wall-painter		2	5	6
Figure-painter		4	16	6
Shipwright in sea-vessels		1	18	2
Ditto in river-vessels		1	11	8
The driver of a mule, with food		0	15	10
Brazier, for his work in brass	℔ lb	0	5	3
Ditto, for his work in copper		0	3	10
For a hooded cloak		0	13	2
For breeches		0	13	2
For hose or stockings		0	2	5
For the master appointed to teach letters, for each boy	℔ month	1	11	8
For the arithmetician, for each boy		2	7	3
For the Greek and Latin grammarian, for each pupil		6	8	8
To the advocate or lawyer, for an application to the court *(in postulatione)*		6	8	8
At hearing the cause *(in cognitione)*		32	6	0
An ox hide, prepared for soling boots and shoes, and for making straps and harness		19	7	6
A beaver's skin		3	4	4
A leopard's or lion's skin		32	6	0
The same made up		40	8	0
Boots *(caligæ)* for muleteers or labourers of the best kind, without nails		3	17	6
Military caligæ, without nails		3	4	6

Caligæ for the equestrian order	£2	6	6
Women's caligæ	1	19	0
Millet, whole ℔ English peck	1	12	0
Ditto, bruised	3	4	0
Beans, whole	1	18	6
Ditto, bruised	3	4	0
Lentils	3	4	0
Pease, whole	1	18	6
Ditto, bruised	3	4	0
Oats	0	19	9
Old wine of the best quality ℔ English pint	0	10	0
Ditto of secondary quality	0	6	8
Rustic wine	0	3	4
Beer called *Camus*	0	1	8
Zythus, Egyptian beer	0	0	10

The above catalogue of articles is selected from a list of near four hundred commodities, with the highest price at which it was lawful to sell them. If it does not throw much light on the production and consumption of gold and silver, the intelligent reader may be gratified in contrasting the relative prices of one class of commodities with those of another, and the rate of human labour to them respectively. The whole of this valuable document, as collected by M. Væscovali and Mr. Banks, and corrected by Col. Leake, has been with great propriety preserved in the first volume of the Transactions of the Royal Society of Literature, and has been translated into English by the colonel, and appended to his "Journal of a Tour in Asia Minor, &c."

Two events occurred towards the conclusion of the period we have been considering, which show in a striking manner how vastly the stock of the precious metals must have decreased in the capitals of the eastern and of the western empires, when compared with what Rome herself alone possessed in the time of her highest prosperity and grandeur.

Alaric, the Gothic king, at the head of a numerous body, burst upon Italy in the reign of Honorius, in the year 408, and, carrying alarm and devastation in his rapid progress, laid siege to Imperial Rome, and at length was induced to abandon his purpose on the immediate payment of five thousand pounds of gold, of thirty thousand pounds of silver, of four thousand robes of silk, of three thousand pieces of scarlet cloth, and of three thousand pounds weight of pepper.

Thus for the sum of two hundred and ninety thousand pounds was rescued from destruction a city which under the first of its emperors could have numbered among its citizens several individuals possessed of ten times that amount. Within less than forty years from this ransom of Rome, the more recently founded capital was likewise assailed. Theodosius, the Emperor of Constantinople, was forced to solicit the clemency of Attila, the leader of the Huns, who imperiously dictated harsh and humiliating

conditions of peace. "The emperor of the east resigned, by an express or tacit convention, an extensive and important territory, which stretched along the southern banks of the Danube, from Singidunum, or Belgrade, as far as Novæ, in the diocess of Thrace. The King of the Huns required and obtained that his tribute or subsidy should be augmented from seven hundred pounds of gold (£28,000) to the annual sum of two thousand one hundred (£84,000); and he stipulated the immediate payment of six thousand pounds of gold (£240,000) to defray the expenses or to expiate the guilt of the war.

"One might imagine that such a demand, which scarcely equalled the measure of private wealth, would have been readily discharged by the opulent empire of the east; and the public distress affords a remarkable proof of the impoverished or at least of the disorderly state of the finances. The immediate supplies had been exhausted by the unforeseen necessity of military preparations. A personal contribution, rigorously but capriciously imposed on the members of the senatorian order, was the only expedient that could disarm, without loss of time, the impatient avarice of Attila; and the poverty of the nobles compelled them to adopt the scandalous resource of exposing to public auction

the jewels of their wives and the hereditary ornaments of their palaces[1]."

An account is given by Chrysostom, as quoted by Gibbon, of the gold and silver furniture of what was reckoned a wealthy senator: "that each wealthy house possessed a semicircular table of massy silver, such as two men could scarcely lift, a vase of solid gold of the weight of forty pounds, besides cups and dishes." This could not be worth more, if so much, as two thousand five hundred pounds of our money; an amount which is exceeded by that of some thousand families in England, when their plate, watches, and personal ornaments are included!

[1] Gibbon's Decline and Fall of the Roman Empire, chap. xxxiv.

CHAPTER X.

On the production of the precious metals from the dissolution of the western Roman empire to the discovery of America.

THE century which passed over between the dissolution of the western empire and the appearance of Mahomet was one of agitation and confusion. The eastern empire was rapidly declining: the tribes who afterwards formed the kingdoms of western Europe were yet unsettled in the territories they had acquired, and had assumed no form of civil policy. No possessions were secure to individuals; and in such a state of society, if mining was carried on, it must have been to obtain the inferior metals rather than gold and silver. The compendious value of the precious metals would present temptations to violence which must have been irresistible to hordes of undisciplined and ferocious warriors.

When the Mahometan power arose, its aspect was sufficiently terrific to continue the suspension of the mines. The precious metals were sought not by exploring the bowels of the earth, but by the more summary process of conquest, tribute, and plunder.

In the two centuries which had passed between the termination of the Roman empire and the propagation of the Mahometan religion, the various tribes who had gained possession of the several countries before subject to Rome had settled down, not into peaceful, though into organized communities.

The unconquered Germans, united with or allied to the Huns, the Vandals, the Suevi, and others, had formed the duchies of Bohemia, of Bavaria, of Swabia, of Saxony, and several smaller independent states. The Goths, the Alemanni, and the Burgundians formed the nation of the Franks, under the successors of Clovis; whilst a large portion of Gaul or France was possessed by the Visigoths, who, jointly with the Suevi, occupied nearly the whole of Spain. The Ostrogoths, in possession of almost the whole of Italy, had formed in it the kingdom of the Lombards. The Saxon heptarchy ruled in England. The Roman empire in Africa, though it had swallowed up the temporary kingdom of the Vandals, was in such a state of weakness as to become an easy prey to the followers of the new Arabian prophet. In this period, from about 480 to 670 or 680, the greatest diligence has been able to discover no trace, in any author, of the operations of mining having been carried on. It is true that the documents of the period are rare, and those

of the succeeding age, or of the reign of Charlemagne, afford no intelligence on the subject. We must therefore have recourse to such information as can be gleaned by groping through the obscure writings of the middle ages.

If the calculation we have hypothetically before made, and brought down to the year 482, be continued through the unexplorable period when it seems probable the consumption of the precious metals was proceeding, we may calculate, as before, by periods of thirty-six years, and estimate that about 734 the actual quantity of them was reduced thus (as shown by the previous calculation in page 225):—

In the year 518	£78,229,700
554	70,406,730
590	63,364,057
626	57,027,652
662	51,324,887
698	46,192,399
734	41,573,160
770	37,415,840
806	33,674,256

Supposing the quantity of the precious metals in circulation to have been reduced in quantity from the time of Augustus to the beginning of the ninth century in the proportion that is here presumed, we might expect to have found a proportionate reduction in the money prices of all the commodities, which in the operations of exchanging them with each other are reduced

to a metallic value; but in the period under consideration, though diligence has not been restricted to a slight search, no such notices of prices have been found as can be entitled to any confidence. In that respect those centuries may be emphatically denominated the dark ages.

It may however be inferred, and that without any great presumption, that the decline in prices had been gradual during the whole course of centuries, because in the following ages, when notices of prices do occur, as will be hereafter shown, they had fallen so excessively that nothing but a very slow and gradual depression, and that of universal extent, could have prevented their being remarked as a most extraordinary phenomenon.

Before we proceed to take a view of the mining operations at the period when, after a long cessation, they were again resumed in several of the countries of Europe, we must premise that the information which can be obtained is neither precise nor statistical. Diligence may inquire without obtaining satisfactory answers, and it must suffice to produce such answers to the public as can be obtained, which, even when condensed into a narrow compass, may, at least it is so apprehended in the present case, appear to the readers to be prolix and perhaps tiresome.

Turkey. Before examining the state of the mining in the other parts of Europe, we may properly ad-

vert to those which now form a part of the Turkish dominions. The celebrity of the mines of Macedonia in the early ages has been already spoken of, and we now revert to them at a later period. Dr. Belon of Paris, physician to Francis the first, visited those mines by order of that monarch between the years 1546 and 1549. He found the mines in the village of Siderocapso, not far from Thessalonica or Salonica. "They are," he says, "on the side of a mountain, and the situation very much resembles that of Joachimtahl in Bohemia."

The working of the mines and the trade they occasioned had drawn together a great number of people, so that the place had more the appearance of a city than a village. The inhabitants were of various nations—Sclavonians, Bulgarians, Greeks, Albanians. Besides them were many Jews, who conversed with each other in the Spanish language. These latter people were accused of corrupting the gold by mixing with it various alloys. They divided the gold so alloyed into several classes, denominating each, according to their purity, ducat-gold, pistole-gold, crown-gold, or maille-gold.

The manner of working both the mines and the metal had been introduced by Germans, as the names of all their implements and of all the operations which were performed were expressed in that language; but the mode of separating

the gold from the silver and from the lead by means of aquafortis had been taught to the miners by an Armenian.

"These mines," he says, "yield so much gold and silver, that the Emperor of Turkey draws from them eighteen thousand ducats a month, and in some months it has amounted to thirty thousand ducats. Within the last fifteen years the produce has declined, and the duties to the emperor have not exceeded fourteen thousand ducats. The persons who carried on the operations had formerly enriched themselves more than they were thought to do at present[1]."

Austria. It is highly probable that the mines of Hungary were those which were first worked in what are now the dominions of the house of Austria, though at that time it was an independent kingdom, extending over the ancient Dacia, now Transylvania, and Walachia—over Upper Mœsia, now Servia—and over the two

[1] See Les Anciens Mineralogistes du Royaume de France, par M. Gobet, vol. i. p. 53.

If the remarking on mines in recent times seems to be inconsistent with the title of this chapter, it must be pleaded as an apology, that M. Gobet expresses an opinion that these mines had been formerly worked by the first Mahometan invaders, though the ground of that opinion does not appear. The author felt unwilling to omit any notice that came in his way respecting mines in Turkey, concerning which so little has been made known by any European authors.

Panonias; the Upper containing the present provinces of Carniola, Carinthia, and the greater part of Austria, and the Lower comprehending Bosnia, Sclavonia, and that part of modern Hungary which lies beyond the Danube.

There are different opinions respecting the commencement of mining operations at Chemnitz and Kremnitz. Ferber[1], in his work on the mines of Hungary, dates the opening of Chemnitz in 745, and that of Kremnitz in 770; whereas George Agricola, who was himself chief director of the mines, as well as burgomaster of Chemnitz, and eminently skilled in mineralogy, in his work entitled "De Re metallica," published in 1561, carries the renewal of these works back to a date nearly one hundred years earlier. Though the simple fact of these mines being opened at an early period is related, there are no records that can lead to a judgment of the extent of the operations, or of the portion of metallic wealth they yielded. Ferber, himself a Saxon, says they were probably worked by natives of Saxony. They were, however, obstructed, and the works destroyed, in 1442, by the Bishop of Erlau, who, at the head of four thousand Poles, took possession of them[2].

[1] See Ferber über die Gebirge und Bergwerke in Ungarn. Berlin, 1730.

[2] There are no statistical accounts till the year 1690, when a great increase is said to have taken place in the quantity of

The silver in these mines was chiefly found in lead, in a proportion varying from two to twenty-two ounces of silver in a hundred pounds of lead. There has always been a great difficulty, and regular heavy expense, in keeping out the water from these mines. Formerly ducats were coined at Kremnitz from the gold found there, which are distinguished by the letters K.B., the initials of the Hungarian words *Kermees Banya,* signifying Kremnitz Mines; but of late years the gold and silver produced from Hungary have been coined in Vienna.

Dr. Edward Brown, an English physician, who visited the Hungarian mines about the year 1670, and published his Travels in 1685, says that the mines of Chemnitz had been worked nearly nine hundred and fifty years, and are the richest in gold of all in the kingdom. He also speaks of a mine at Glass-Hitten, about seven miles from Chemnitz, which was formerly worked, "but is now lost, no man knowing where the entrance was, since the time that Bethlem Gabor overran that country, and the

gold and silver that was extracted, amounting, in the three following years, to 132,425 ducats of gold, and 2,851,815 gulden of silver, or in English money to about £340,000. In 1729, the produce was 557 marks of gold and 13,192 marks of silver, or about £40,000. In 1730, the quantity was 756 marks of gold and 8846 of silver, or about £35,800; and in 1732 only 677 marks of gold and 1279 of silver, or about £18,806.

inhabitants fled away." From the representation he gives, it can scarcely be inferred that the mines were either productively or beneficially worked, "though occasionally," he says, "there have been pieces of pure virgin gold found, some of which I have seen in the elector of Saxony's repository; one piece as broad as the palm of my hand, and others less; but such are very rare[1]."

M. Jars, who visited the mines of Hungary about eighty years ago, says that in ancient times they were managed by companies, who were successively compelled to abandon them, on account of the wars, pestilence, and famine with which they were afflicted, by which they were prevented from advancing the necessary supplies of money. As these companies acted under grants from the crown, when they could no longer continue the working, the grants were resumed; but as the government determined to conduct the works, they allowed to the former grantees five shares out of each hundred and twenty-eight, upon which plan they were carried on when M. Jars inspected the mines.

Some of these mines he represents as rich in auriferous ore, each quintal of it yielding one hundred ounces of silver, and some gold, and also mercury, in the form of cinnabar.

[1] Brown's Travels through Hungaria, Servia, Bulgaria, Macedonia, &c. &c.

The enormous expense of raising the water induced the parties interested to form an adit for draining the district of the mines, to which private individuals and other companies besides the crown contributed. An Englishman, whose name is not mentioned, constructed some engines to complete the draining of these mines, on condition of receiving, during ten years, what should be saved in the expense of labour, and is said to have erected five engines, and to have gained a large sum of money by the undertaking [1].

Baron Born, in the employment of the Austrian government, in his survey of Hungary, found in Siebengebirgen a mine from which pure gold was obtained. "The lord of the mine," he says, "Count Stephen von Gyulai, for some reason with which I am not acquainted, rarely allows any one in the service of the emperor to visit his mine; but the whole operation, under the management of his Wallachian overseer, was conducted in so miserable a manner, that a man must be a Wallachian to venture his life by descending the shaft [2]."

The baron remarks that, in Hungary, and even at Chemnitz, he found, in the ancient workings, that none but the richest ores had

[1] See Voyages Metallurgiques, par feu M. Jars de l'Académie Royal des Sciences de Paris, 1774.

[2] Born's Briefe über mineralogische Gegenstände.

been taken out, whilst those of inferior quality had been left behind. In speaking of the gold-washings in the Temeswarer Bannat, he says, the operations were performed exclusively by the gipsies, who display great skill in finding it. They dig chiefly on the banks of the river Nera, where more gold is found than in the bottom of the stream. There are many remains of ancient workings, which are deemed by the baron to be the sources from which the small particles which were brought down by the stream were deposited. He found also, in the vicinity of Boschowitz, other gipsies washing the sands for gold. In each spot he made his calculations, and they satisfied him that the produce did not pay for the labour that was employed on it[1].

In the Facebajer mountains also, the baron says, he found many evidences of ancient workings, which he judges must have been executed when slaves and convicts were employed in the mines. He infers this from the great labour which the work must have required before the use of gunpowder was known; for the passages, which are three hundred fathoms in length, and six feet in height and breadth, are carried through a bed of hornstein by the help of the pickaxe, chisel, and mallet alone. He infers from the accurate direction of the galleries, that

[1] Born's Briefe über Gold waschereyen in Bannat.

the planners of them must have had some knowledge of subterranean geometry.

Of the more early working of these mines no information could be obtained; but, in more recent times, they were discovered and opened, in the fifteenth century, by King Sigismund, who is said to have extracted from them treasures of gold to an incredible amount[1].

In the Bohemian dominions of Austria there were formerly gold washings. Those were in the southern range of the mountains on the river Iser, in the circles of Bedschow and Turnau, before that river falls into the Elbe[2].

Joachimsthal, in the circle of Saatz in Bohemia, contains mines of silver; but at what period the workings in them commenced, or how far they had yielded treasure, does not appear from any records now to be found. The galleries have been carried to the prodigious extent of five thousand six hundred fathoms, and some of the shafts are three hundred and fifty fathoms in perpendicular depth[3].

[1] Briefe über mineralogische Gegenstände.

[2] Whatever may have been formerly the case, the sand does not now yield more than one grain of gold in a hundred weight; and though chemists of skill have found nearly that quantity, it is supposed that so much is not regularly to be obtained. There are at present no people searching for gold, nor have there been any for several centuries.—See Reus Mineralogische Beschreibung des Buntzlauer Kreis in Böhmen.

[3] The silver ores which are found in this and the adjoining district of Catharinaberg are native silver, which is attached

The vicinity of Salzburg, comprehending a great part of the Noric Alps, afforded in ancient times considerable quantities of gold and some silver; and though but little has been produced of late years, there are sufficient records in existence to attest their productiveness down to the middle of the fourteenth century. How much earlier they may have been worked there are now no means of ascertaining.

At Altenberg the metals were found in beds of gneiss, in which was mingled some feldspath and abundance of granite.[1] In the year 1287, Archbishop Rudolph granted them to the canons of his cathedral, to whom they probably yielded but little profit. In 1357, they seem to have been conducted by Boestel, who was burgrave of the district; but their greatest productiveness was after 1442, when they were farmed out to Fredrich von Emerberg, Erhard Wendelstein, and the two brothers, Sigmund and Christoph Mosshammer, whose partnership was prosperous to themselves, and beneficial to the surrounding district. The profit gained

to different vein stones, and assume different forms, to which the names of *vitreous silver ore*, of *red silver ore*, and *white silver ore*, are given.

These mines, however, as well as those of the circle of Tabor at Berestadt, are at present much more explored, for the sake of the cobalt and other minerals which they afford, than on account of the gold and silver they ever yield.—See Ferber über die Gebirge und Bergwerke in Ungarn und Böhmen. Berlin, 1780.

was such as to excite the avarice of a succeeding prelate, who was dissatisfied with his rent, and the tenth of the silver and gold, and by various steps endeavoured to obtain possession of what had been leased; and, at length, in the beginning of the sixteenth century, upon the ground that protestantism had been taught among the miners by a missionary, named Kranzeifer, he succeeded in avoiding the lease. The best of the workmen forsook the district, the mines were first contracted and then abandoned, and the prelate lost the income he had derived from the property. Fallen buildings, heaps of scoriæ, open shafts, and choked galleries still attest the former prosperity of the mining operations of the district [1].

The mines of Schellgadin are at present the most important. The earliest records respecting them is in the year 1378, when Archbishop Pilgrim the second leased them to farmers for three hundred and twenty pounds rent [2]. In

[1] Vierthaler. Wanderungen durch Salzburg, Berchtesgaden und Osterreich, vol. i. p. 141.

[2] They are said to have been nearly exhausted, so that, being worked by the government, a loss was incurred between 1775 and 1780 of about nine thousand pounds. By introducing greater economy, they have been kept at work, and for the first time, in 1790, produced a profit of £250. It appears that the gold is in grains, from the size of a grain of linseed to an almost invisible speck, and from 12 to 14 ounces are extracted from fifty tons of ore.—Vierthaler, vol. i. p. 145.

Rothhausberg, three centuries ago, the valleys swarmed with inhabitants depending on the mines of gold; but within the last century the decline in the product has been great. The net profit to the archbishop about 1776 was near four thousand pounds yearly, but from 1795 to 1800 scarcely six hundred pounds. On an average of twenty-two years, from 1778 to 1800, the produce was thirty-five pounds of gold and three hundred and forty pounds of silver. These mines in ancient times had received the title of the "Throne of Pluto." If they deserved that name three hundred years ago, the produce must have been much greater, or the ideas of those who conferred it must have been of a very contracted kind with respect to mineral wealth[1].

If we may trust to an author who visited this district in 1784, the Romans must have originally worked these mines, and having suffered them to go to decay, they were again put in activity. Hacquet says[2], that in the mining archives he found this passage, "*Aurifodinæ Romanorum in campo humido versus septentrionem per multos annos desertæ jacuere; anno* 719 *iterum cœptæ sunt.*"

The discovery of America and of the mines it contained seems to have kindled a most vehement passion for exploring the bowels of the

[1] Vierthaler, vol. i. p. 239. [2] Hacquet, p. 112.

earth in search for gold, in most of the countries of Europe; but in no part of it to so great an extent as in the bishopric of Salzburg. The inhabitants of that country seemed to think themselves within the reach of the apple of the Hesperides and of the golden fleece, and to find in their streams the Pactolus of antiquity. Between the years 1538 and 1562 more than a thousand leases of mines were taken. The greatest activity prevailed, and one or two large fortunes were made; but by the beginning of the next century, though large quantities of iron, copper, calamine, cobalt, and vitriol, with some gold and silver, had been extracted, partly from disappointment and partly on account of religious differences, the district was deprived of the greater portion of its inhabitants. In process of time, too, the lawines or glaciers extended themselves lower down on the mountain, and rendered the openings to the mines inaccessible; yet so late as 1796, efforts were directed by the then archbishop to work the mines, which were filled with snow and ice, but with very little success [1].

In the Tyrol, near to Brixen, between the towns of Rattenburg and Schwatz, are silver mines, which during the excitement in the sixteenth century had obtained the name of El

[1] Vierthaler, vol. i. p. 261.

Dorado. How much earlier they had been worked does not appear; but in the year 1523 they produced 38,000 pounds of silver; in the next year, 33,700; in 1525, 52,800. In 1564 they fell off so as to yield only 11,400 pounds; and though once they increased again to 20,000 pounds, they never more attained that point; and have long since ceased to afford any [1].

About two miles from Zell, in the Tyrol, is a small establishment where the sand is washed for gold. Mines were opened here for gold by one Spengler, who was brought from the Hartz in 1435; and between that time and the year 1504 sixteen mines in the whole were opened. As the mines were situated in a province belonging jointly to the archbishop of Salzburg and the prince of Tyrol, disputes arose which impeded the work, and finally suspended it [2].

Besides the product of the mines, gold was obtained by washing in many parts of the Austrian dominions. In the Danube there were formerly gold washings, and even in the present day some is found in the sands between Vienna and Presburg, mixed with transparent quartz and iron, but the quantity is so small as to be almost unworthy of notice.

More extended accounts of the Austrian mines than of other countries have been deemed pro-

[1] Vierthaler, vol. ii. p. 178. [2] Idem, vol. ii. p. 191.

per: they were the chief sources of mineral wealth through the middle ages. Their produce in no instances and in no periods seems to have been large, when compared with what was yielded in distant ages in Egypt, in Spain, in Asia, and in Thrace, and in modern times in Mexico and Peru. But their effect on the transactions of the world must be contemplated, not by what they would produce on the stock of gold and silver in existence in the time of Augustus or in the present day, but by what they must have produced on the very small amount of the precious metals which was possessed at the time of their respective workings.

Saxony. The mines of Saxony were first discovered in the tenth century, when the whole district in which they are situated was covered with wood, and without inhabitants[1]. Some carriers from Halle, on their way to Bohemia, where they carried salt, observing metallic substances in the tracks made by the wheels, some of these were taken up and sent to Goslar to be examined, when they were found to consist of lead with a considerable quantity of silver. This led to the establishments for mining, which have continued, with some variations in their products, from the year 1169 to the present day. For some years,

[1] Merkel's und Engelhardt's Erdebeschreibung von Kursachsen. Vol. i. p. 99.

beginning about 1320 or 1330, the mines of Schneeberg are said to have yielded so large a portion of silver, that the tithes on it amounted in thirty years to 324,000 quintals. If so, the produce must have been at the rate of about £300,000 sterling annually. These mines must however have been exhausted long ago, as no appearance or trace of them is now in existence, and the spot where they are said to have been worked is covered with corn-fields and vineyards [1].

There is no part of the world in which the operations of mining are conducted with more skill, economy, and industry, than in Saxony. The annual produce of the precious metals, taken on an average of late years, cannot be estimated higher than about four hundred thousand ounces of silver, and a few ounces of gold [2]. The work affords employment to about fifty or sixty thousand persons; but the most important of the products are lead, copper, cobalt, iron, manganese, and fossil coal. There were formerly gold washings in the streams, and gold was found in the small brooks that run into the Mulda, and in that river itself; but those operations have ceased long ago [3].

The mines in the Hartz forest in Germany, Hanover.

[1] Putter's Reichsgeschichte in ihrem Hauptfaden, page 380.
[2] Hassel's Erdebeschreibung. Vol. iv. p. 337.
[3] Mineralogische Geschcchte des Erzegebirges.

which at the time of their discovery formed a portion of Saxony, are now partly in the dominion of Hanover, and partly in that of Brunswick, and a small division in those of Prussia, have been worked from a distant period, but were certainly not known in the early ages of the world. There are various conflicting opinions among the learned in antiquities respecting the discovery of the mineral wealth of the Hartz. The most probable accounts fix it in the tenth century, and the tradition is, that a hunter of the name of Ramm, when engaged in the chase, had fastened his horse to a tree, who by pawing with his feet had scraped away the soil, and thereby discovered some minerals; that specimens of them were sent to the emperor Otho, to whom all minerals, as regalities of the empire, belonged, and who sent expert miners to examine the district, from Franconia. These Franconians worked the mines for the emperor, and gained him very great profits about the year 972. This course proceeded till the year 1006, when a famine, followed by a pestilence, caused the works to cease. They were resumed ten years after, in 1016, and continued at work till 1181, when they were closed by warlike operations, and continued in a state of inactivity till 1209. From that year they continued at work with variations in their produce, till sometime between 1344 and 1353, when, according to one

account, from a most contagious pestilence, and according to another by the falling in of the galleries, by which many lives were lost, and four hundred widows were left to lament their husbands, they were once more abandoned.

In the year 1356, the golden bull of the Emperor Charles the IVth was issued. By it, these mines, as well as all others within the German empire, were conceded in full property to the several sovereign princes in whose dominions they were situated.

This did not communicate to the Hartz mines their former activity until the year 1453, when they were again restored, and have continued at work up to the present time.

We have no authentic documents to show through the whole series of years what has been the produce of gold and silver; but, supposing the produce, in the years of activity, to be nearly the same as of late years, we may estimate the whole Hartz, including the dominions of Hanover and Brunswick, with the small part which belongs to Prussia, to have yielded about sixty ounces of gold, and about three hundred thousand ounces of silver yearly [1].

[1] The other minerals of the district are of far greater value, and gold and silver, which were the cause of their original workings, have long continued objects of inferior importance to the iron, copper, lead, zinc, vitriol, and sulphur, which form

The mines belonging to Prussia, besides the small portion in the Hartz, which is before alluded to, are very inconsiderable as far as regards the precious metals. Those in the provinces of Mansfeld and Rothenburg, ceded by Saxony in 1816, are said, in the thirteenth century, to have yielded yearly about thirty thousand ounces of silver, but we have no means of ascertaining if they were worked at any former period.

Prussia. The mines of Tarnowitz, in the Prussian province of Silesia, exhibit evident proofs of having been worked in very ancient times, and to a much greater extent than in more modern days. There are records which show that, after an uncertain suspension, they were revived by some protestant refugees from the county of Mansfeld, about the year 1524. George Mar-

the bases of the several manufactures carried on in this mountain district.

The paternal government of Hanover is liberal to the poor inhabitants of the Hartz. It allows them wood for mining purposes from its forests without payment, and stores up a large quantity of bread-corn in seasons of abundance in a magazine at Osterode, which is dispensed to them at a cheap rate, when, in the variations of years, the price advances. These notices respecting the Hartz are abridged from Voyages Metallurgiques de Jars, vol. i.; from Plethos Erdebeschreibung der Fursten Wolfenbutel; from Hassel, vol. iv.; and part are written from personal inquiries made by the author on the spot in 1827.

grave of Brandenburg, and his successor, George Fredrick, are stated to have enriched themselves by the produce of these mines, which were very profitable till about the year 1605[1].

We have been induced to search with more diligence for any intelligence respecting the mines in Germany, especially those which were worked in the middle ages, from having met with the following remark in Anderson's History of Commerce, vol. i. p. 67.

"It was the silver mines found in Germany in the tenth and following centuries which gradually increased the quantity of money, and the price of necessaries even before the discovery of America."

Whatever the increase on those two heads may have been, it must not be attributed solely to the mines of Germany; and it may not, therefore, be unnecessary to extend our inquiries, and to communicate the result of them to the other countries of Europe.

In the empire of Charlemagne all the mines were the property of the crown, and continued to be so till the reign of Charles the VIth, who in May, 1451, issued an ordinance, by which the rights of the crown were abandoned, France.

[1] The present produce of the mines of Tarnowitz is said not to exceed one hundred ounces of gold and eighty thousand ounces of silver.—Kapfs Skizzen aus der Geschichte des Schleischen Mineralreichs, 1794.

the chief object of which was said to have been to promote the working of mines in the Mâconnois and in the Lyonnois.

It appears, however, by letters patent which Charlemagne granted in 786 to his two sons, Charles and Louis, that gold and silver were the chief objects whose search engaged the attention of that monarch. The grant referred to was of certain districts with the royalties of the crown. "*Plus tractum regionis in saltu nostro Thuringiaco, ad* 20 *milliaria in longitudine et* 10 *in latitudine, jure hereditario possedendum; et facultatem damus in territorio districti illius dominationis quærere et fodere aurum argentumque, atque omnia metalla.*"—In Goldasti. —It appears that the right of coining money was a privilege conveyed with the grant of the mining-district, from the expressions in it, "*insuper ut debeatis et possitis aureos, grossos, et denarios monetare . . . . . ut bona moneta tanquam nostra,*" &c.

The archives of Lorraine contain some intimations of mines. It is there recorded that Gerrard, the 34th Bishop of Toul, in the year 975, granted several estates to the church of Diez, but reserved to himself *decimas minæ argenti*, the tithes of the silver mines.

It is related in the Chronicle of Lenones, that in the year 997 two very distinguished men arrived at Belmont, and opened mines; "*quo-*

rum diebus argentariæ fossa reperta sunt, in quibus multum argentum esse fertur effossum."

The Duke of Lorraine, Antoine, in a deed dated in 1120, made some extensive grants of land, but retained to himself whatever silver might exist in the mountains.

These intimations serve to show that some silver must have been known, or have been believed to exist at that time in that part of what was a portion of the Frank kingdom.

A class of mines has been noticed in France of which it is difficult to determine whether they were worked by the Romans as well as by the more modern possessors of the territory. The greater part of these are in the province of Languedoc. These are minutely enumerated by Genssane in his "Histoire Naturelle de la Province de Languedoc," published at Marseilles, 1766.

There is at Pradal, a small village situated a little above the town of Ville-Magne, abundant proof of very extensive mining-operations. All the works which are above the level of the little river Maire, and which are of an immense extent, exist to this day. They have been carried below the bed of the river, and that portion of them has been submerged. If attention be paid to the enormous excavations in the interior of the mountain, it will be evident that a vast

quantity of metal must have been formerly extracted. The silver was coined at Ville-Magne, at a mint established there; the walls, the ornaments, and the sculpture of which display, even in their ruins, a royal origin[1]. The number of other and smaller mines, both of lead and of silver, in the same neighbourhood, is very considerable, but, according to Genssane, of very little productiveness at present. Some of them had been worked within the memory of persons still alive, and of others it was merely reported that they had been exhausted in remote ages.

Thus, near the baths of Rennes, in Languedoc[2] are remains of very extensive mines of lead and silver, the ruins of which point out the quality of the products. This is particularly the case with the mines in the mountains of Cardon and Roquenère, and with that of gold in the mountain Blanchfort, about a quarter of a league below the baths[3].

An ancient mine of silver, at the foot of the Chateau de la Caunette, had been examined by a commission from the king during the ministry of Colbert, when it was found to be filled with water. Genssane visited and examined that

[1] Genssane, vol. i. p. 278.
[2] Idem, vol. ii. p. 187.
[3] Idem, vol. iv. p. 187.

mine, and reports it to be in the same state; but he found in it a date, that of 1316, which shows the period of its activity[1].

In the mountains of Cevennes, gold and silver are still found in *paillettes* in the rivers La Seze, l'Ardeche, La Gardon, and l'Eraut. They are supposed to be detached from the *filons d'or* in those mountains, and brought by the streams through the ravines. This gold was remarked by Agricola more than three centuries before Genssane visited the spot, as well as the peculiarity which still exists, that the gold is only to be found in the same places as those smooth black pebbles resembling touch-stones, called, by those who seek for gold, "la mère de l'or."

A great quantity of scoriæ, the remains of ancient workings, are observable in this district, especially near the little river Gagnere. The Abbé de Gua, who examined the heaps, thought he discovered proofs of their having been the results of the operations of miners who had extracted gold, but Genssane was rather disposed to attribute them to some extensive workings of mines of antimony.

Some silver appears to have been separated from the lead which the mines of that metal supplied to the wants of France. Thus at Mas-

[1] Genssane, vol. iv. p. 294.

Dieu, in Languedoc, were to be seen the remains of the operations of antiquity in great heaps of cinders around mines which have been long exhausted, in which were found particles of both lead and silver; and another lead mine is to be seen near St. Sauveur, which still retains the ancient name l'Argentière [1].

Dr. Belon, who has been before mentioned, found in the department now called the Gard, in 1548, about six thousand persons occupied in working mines, principally in search of gold.

He relates a strange superstition among the inhabitants of that district, which, for its singularity, may not be unfit to be noticed [2].

In the French division of the Pyrenneen mountains there are still the pits which led to mines

[1] Genssane, vol. i. p. 175 and 230.

[2] "The inhabitants of Pesquare," he says, "and of the borders of the lake of Gard, and also of Salo, are firmly persuaded that the carp in those lakes are nourished with pure gold; and a great portion of the people in the Lyonnois are fully satisfied that the fish called humble and emblons eat no other food than gold. There is not a peasant in the environs of the lake of Bourgil who will not maintain that the laurets, a fish sold daily in Lyons, feed on pure gold alone. The same is the belief of the people on the lake Paladron in Savoy, and of those near Lodi."

"But," adds the doctor, "having carefully examined the stomachs of these several fishes, I have found that they lived on other substances, and that from the anatomy of the stomach it is impossible they should be able to digest gold."—Gobet, Les Anciens Minéralogistes de France, vol. ii. p. 63.

that have been long disused. They bear evident marks of a different origin. Some of these pits are round, and are, with great appearance of probability, attributed to the Romans. Others of them are square, and are supposed to have been formed in later ages by the Moors, who ruled in Spain,—who seem to have followed, in the excavations, the same form as they generally adopted in their buildings[1].

Malus the elder was sent by Henry the Fourth, in the latter years of his reign, to examine the state of the ancient mines in the Pyrennees. In his report on the subject, it is affirmed that they are as rich as those of Potosi; and, strange as it may appear, in an age when absolute personal slavery had been long abolished, recommended that slaves should be employed to perform the labour. The king, who was then keenly alive to all kinds of mining-projects, gave orders to commence opening and working these ancient pits; but the sudden death of the monarch put a stop to the undertaking.

Gaston de Foix, brother to Charles, King of Navarre, is said to have worked some of those mines to such advantage as enabled him to surpass in his expenditure that of all the monarchs of his day. Gobet remarks, that in his time

[1] Gobet, Les Anciens Minéralogistes de France, vol. ii. p. 122.

the country people were satisfied with getting up the lead, which they were enabled to sell in the cities near them at a better price on account of the silver which was found to be mixed with that inferior metal.

Henry the Fourth seemed to have been excited, by the rumours spread through Europe of the vast wealth of the mines of Peru, to entertain projects for the discovery of similar sources of wealth in his own dominions. He addressed several efforts to the object; but the less sanguine Sully, who viewed the whole with indifference, if not with contempt, co-operated but very faintly in the designs of his master [1].

[1] Under the administration of Cardinal Richelieu, a German adventurer, with his wife, excited his attention to the mines of the precious metals in France. Both the Baron de Beausoleil and Auffenbach and his wife, especially the latter, traversed the kingdom in search of these treasures, and made reports of extravagantly rich mines which they had discovered and proposed to work.

In consequence of their representations, measures were taken to carry extensive plans into execution; but from a variety of causes, which are ably pointed out in the "Metallurgie de Grassin," the whole operations terminated in disappointment, and the loss of the capital that had been expended.

Madame de Beausoleil et Auffenbach appears to have been a more accomplished charlatan than her husband the baron. In a work she published, under the title of "La Restitution de Pluton," addressed to the cardinal, in 1640, she professes great skill in the discovery of mines, and asserts that, after much experience in Hungary and in other parts of the world, she had discovered in various parts of France rich mines, the

The mines of Sardinia, which have been noticed in an earlier part of this inquiry, had pro- Sardinia.

working of which she strongly urges by the representation that "par le moyen desquelles les finances de sa majestie seront beaucoup plus grandes que celles de tous les princes Chrétiens, et ses sujets plus heureux de tous les peuples."

The enumeration which this lady gives is a curious paper, whether it be viewed as an effort of quackery on her part, or as a proof of the view she had of the tendency, in that age, to become the dupes of metallurgists and alchymists, both descriptions of which adepts seem to have abounded.

We give an abridged specimen of her professions. In the Pyrennees, near St. Beal, she found a good mine of gold; in the mountain of Sault, also a mine of gold; at a league from Lorde, a valuable mine of silver; in the county of Foix, a league from the river, a mine of gold; in the mountain Montraustaud, a mine of silver; in the mountain of Cardazel, a mine of silver; at a place called Alsen, a mine of silver; at half a league from Loural, a mine of gold, and another of silver near it, at Desatie; at Cousan, a mine of silver containing much gold; in the barony of Regus, near Narbonne, a mine of gold; in the Condonnois, a mine of gold; in the village of Rouripies, near Pongibant, and in the mountain of Peuj, good mines of silver; in Provence, near to Frejus, a mine of silver; in Dauphiné, a mine of gold in the mountain d'Auriau; and, besides all these, vast mines of lead, iron, copper, sulphur, and coal, and others which yield precious stones, such as granates, rubies, hyacinths, opals, talc, turquoises, amethysts, alum, and diamonds like those of Alençon!!!

Mining in France seems, however, to have engaged the most attention from the beginning of the fifteenth to that of the following century, when various ordinances were issued to promote and regulate the rights of property, and the modes in which the operations were to be conducted. It is not improbable that the discovery of the mines of America, and the current of wealth that flowed from thence to Europe, may

bably continued at work between the period to which that notice refers, and that when the Mahometans from Asia and Africa first gained a footing in Europe. A series of wars must have impeded the operations till after the defeat and capture of Gelimer, the last king of the Vandal race. A peace was concluded then under the sanction of the Greek emperor, who appointed prætorian prefects during the space of near one hundred and seventy years. This state of tranquillity afforded occasion for renewing the work of mining, and for acquiring and accumulating a store of the precious metals of sufficient importance to form an object worthy of military attack; and we accordingly find that "the Arabs, on their way from Africa to the invasion of Spain, landed in Sardinia, and there seized upon large treasures of gold and silver[1]."

Spain and Portugal.

We have already taken notice of the mines of Spain and of their produce in remote ages, when their riches were extracted in succession by the Phœnicians, the Carthaginians, and the Romans. With the decline of the power of the latter people, the productiveness of the mines of

have had the effect of checking the efforts of France in that kind of industry, as they evidently had in the other parts of the ancient continent.

[1] See Cardonne, Histoire de l'Afrique et de l'Espagne sous la Domination des Arabes, vol. i. p. 103. Paris, edit. 1765.

the precious metals seems either to have ceased or to have diminished—at least there are no accounts of any mines being worked under the Suevic or under the Gothic monarchs who at length governed that country, nor any traces of works in mines at this time to be seen, that are not evidently of Roman, of Moorish, or of more modern construction.

The works of the Romans in some parts are so obliterated, and the scoriæ and ashes so decomposed or covered with soil, as to be nearly untraceable except by acute observers. Bowles, of English origin, but one of the best Spanish writers on natural history, speaking of some great caverns between Ronda and Gibraltar, says, "Many people believe, without any reason, that these excavations are the work of the Moors; but there is good reason to conclude that they are the work of ages long prior to the invasion of Spain by that people[1]." He then proceeds to give his reasons for this opinion:—On the Spanish as well as on the French side of the Pyrennees, the remains of the shafts dug by the Romans are distinguished from those of Moorish work by their shape—the first being round, the second square; which Bowles accounts for by supposing that the Romans constructed

[1] La Historia natural y la Geografia fisica de España, p. 30.

their forts round in order to resist the force of the battering-rams with which they were liable to be attacked, and then dug their shafts in imitation of their fortifications; but as the Moors apprehended no attacks from such implements, their fortresses were built square, and the pits leading to the mines were constructed in a similar manner.

Our present object is to examine what was the state of mining from the first invasion of Spain by the Mahometans down to their final expulsion, which latter event was nearly contemporary with the discovery of the western world. Cardonne remarks[1], "That if we may judge from the imposts levied on the Christians by the Moors for indulging them in the exercise of their religious rites, there must have been great wealth accumulated in the hands of some individuals at the time of the invasion, or much gold and silver must have been extracted from the mines." The same author asserts, but has produced none of the evidence for the facts he has stated, that "the mines of gold and silver which existed in Spain were a great source of wealth to the Arabs: they employed a great number of workmen, and extracted a great quantity of those metals." (Page 340.) In

[1] Histoire de l'Afrique et de l'Espagne sous la Domination des Arabes, vol. i. p. 180.

another passage, Cardonne speaks of Christian slaves being employed by the Moors in the work of the mines.

We have not been fortunate enough to meet with any passages in the Spanish Chronicles which throw any light on the subject; and the Spanish Arabian writers, whose works are said to be still preserved, and which, when Clarke visited and described the Escurial in 1763, consisted of eighteen hundred and twenty-four volumes, have been scarcely examined by any Christian literati.

In the absence of those means of judging of the state of mining under the Arabs which history might have furnished, we have no other resource but that obtained by examining the few relations which are to be found in the writings of such modern travellers as have paid attention to the subject.

In the mountain called Lares, near to which are the remains of a Moorish fortress and of a mosque, is a mine which produced, when examined by Bowles, only emery, but which he thought had been worked by the Moors chiefly on account of the gold then found mixed with it, and the process of separating which he describes according to conjecture, rather than from any records he could procure [1].

[1] Bowles, p. 55.

The mine of Zalamea, to the south of the River Guadiana in Andalusia, appears to have been worked in the middle ages. It contained silver without any mixture of lead, though near it is another mine yielding only lead. The miners seem to have mistaken the direction of the vein, and thereby to have lost it. The remains of a crucible, and of a reverbatory furnace, have been found in it; but it is inundated, which has been caused by neglect, as, according to our author, it is situated on an eminence, and might be easily drained [1].

Near to Cazalla, in the mountain Fuente de la Reina, is the mine of Constantina. In former times, probably by the Moors, it was worked with skill, as is demonstrated by the construction of the shafts and galleries. The vein runs from north to south, and crosses a bed of schist. It was slightly worked when visited by Bowles, owing to the want of funds; though there was abundance of wood near it, and a rivulet running at the foot of the mountain, by which it might be easily drained [2].

The chief mines, however, which the Moors worked in Spain, were those of Linares in the province, or, as the Spaniards call it, the kingdom of Jaen. "The hills which surround the

[1] Bowles, p. 59. See Dillon's Travels in Spain, p. 288.
[2] Idem, page 65.

elevated plain of this district," says Bowles, "are pierced as full of holes as a sieve by the mines which the Moors worked; for it must have been done by them, since the Romans could never have worked in a manner so barbarous[1]." Those Mahometan princes who ruled in Jaen seem to have struggled hard to support their revenues by extracting from the bowels of the earth that wealth which its miserable surface could only yield by excessive toil.

It is probable they supplied their neighbouring states with silver, copper, and lead—some of which minerals are everywhere to be found, and frequently all of them together. The number of shafts in these hills is very surprising. They are formed about five paces from each other; and according to Bowles there were more than five thousand of them[2].

These pits may, and probably were, dug in succession during the time of the Moorish domination, which terminated in Jaen two centuries before the final conquest of Granada. If these pits were the work of five hundred years, each year yielding ten excavations, and those exhausted, as they appear to have been, as soon as they could be robbed of their minerals, we

[1] Bowles, page 416.
[2] Idem, page 416.

shall not estimate, however rich some of the pits may be found, that the annual products of these mines could have been of very great amount.

It may be proper to remark, that though some of these mines of gold and silver which have been noticed were slightly worked when Bowles visited them, they have now entirely ceased.

Bowles says that, "In the sand-hills of Galicia there are still traces of gold; and it is astonishing to observe the prodigious labours which must have been performed to remove the sand, to wash it, and to separate the gold from it. The tradition in the province is, that the gold of this district was appropriated to the private purses of three Roman empresses, namely, Livia, Agrippina, and Faustina. If any learned person could verify and illustrate this tradition, he would enrich natural history and do honour to civil history."

"I know," he says, "that a German minister, sometimes at a great loss, washed these sands and collected gold from them [1]."

Without noticing an untouched vein of gold which Bowles traced in the mountains of Guadarama opposite to St. Ildefonso, or adverting to the gold mine which Donna Isabella worked in the mountains near Talavera, we may proceed to what have been the great objects of

[1] Discurso Preliminar., page 35.

attention from the earliest ages of which history makes mention down to the present time, the mines of Almaden and of Guadalcanal. These mines were well known to the Romans, who expended enormous sums on them: they were continued at work by the Moors, and have only ceased to be productive within a very few years.

The mine of Almaden is of importance to the history of the precious metals, though its chief produce is quicksilver; but that metal has become of such indispensable use in the operation of separating gold and silver from the ores with which they are mixed, or from the quartz or other earths in which they are commonly enclosed, that without it the mines both of the new and the old world would have been less beneficially and extensively worked than they have hitherto been.

At first the cinnabar or mercury was chiefly used as a paint, but its value for other purposes was very early discovered. Theophrastus, who wrote 300 years before Christ, mentions it—as well as Vertuvius, who was a contemporary of Augustus; and Pliny, in the following century, expressly speaks of it as the production of Betica in Spain.

The Romans deemed mercury a poison; but notwithstanding that opinion their matrons used the cinnabar as a paint for the face, and the artists applied it to their works. Pliny says that the

mine was constantly locked up, and the key kept in possession of the governor of the province, who could only open it in pursuance of an order from the emperor, and was obliged to close it again as soon as a specified quantity, which was to be sent to Rome, had been taken out. Every trace of the Roman workings is now obliterated; and it is doubtful whether the Arabs continued to extract much or indeed any cinnabar, for all the present shafts and galleries have been constructed since the discovery of America, and probably owed their extension to the great demand which arose for mercury when the mode of amalgamation was first introduced into the mining-system of Mexico.

The two brothers Fuggars, of a German family, took a lease of the quicksilver mine as well as of that of silver at Guadalcanal, engaging to deliver to the government 450 quintals of mercury; but being unable or unwilling to make good their engagements, they gave up the silver mine and the cinnabar mine at the same time, in the year 1635.

It is doubtful whether the mine of silver at Guadalcanal was much worked, if at all, by the Arabs: if it was, it must have been in the early days of their dominion in Spain; for tradition in the neighbourhood speaks of it as a discovery made in the year 1505, a few years after the final conquest and expulsion of the last of the Moorish

potentates. Whatever it might have produced under the Arabs must have been much less than that subsequently extracted. Under the Castilian monarchs many shafts were sunk and several galleries constructed, and this swelled the quantity of the treasure which was acquired. Very extravagant accounts are given of the amount obtained, but none of sufficient accuracy to obtain credit except that of one author, the historian of the house of Herasti, who says that during a course of years (how many does not appear) the mine yielded eight millions of pesetas—a coin the fifth part of a hard dollar, or about ten-pence of our money—or about three hundred and thirty thousand pounds sterling. This sum is said by the same author to have been applied to the building of that most enormous and gloomy pile the Escurial.

It is probable that at the most prosperous period of their working, both those mines, but especially that of silver, were attended with a heavy loss to the crown; and were consequently, if not abandoned altogether, suffered to proceed towards dilapidation; and thus being a burden to the possessor, were readily conceded to adventurers on what were deemed advantageous terms.

Though the process of these mines from bad to worse till they became extinct does not fall within the period we are now considering, yet

as the history of them illustrates the course which has very commonly accompanied the seeking for wealth by exploring the bowels of the earth for silver and gold, it may not be amiss to digress from the immediate subject and to take a succinct view of it.

The Fuggars obtained possession of the mines about the year 1598. They were the best miners of that age, and it is now visible that their galleries and excavations were constructed conformably to the best principles of the art; but they viewed their concession as a temporary property from which they were to extract what wealth they could with as much expedition as possible, and with the least expense to themselves. With this view they formed many galleries where the minerals appeared the most rich, and speedily forsook them to open others. There are now visible as many as sixteen of these openings, the roofs of which were supported by wooden posts, but so slightly that they have all rotted, and thus the passages became choked up. Two circumstances seem to have accompanied the destruction and abandonment of this undertaking. The Spanish government wished to raise the rent and to impose some taxes, when the Fuggars turned into the mines a stream of water which they had before conducted out of it, by which they became completely inundated. They introduced coining-machines, which they worked in the

mines, converted much of the silver into coin, and thus defrauded the government of its duties; and with that coin gained such powerful protectors about the court, that they were enabled to escape from Spain in 1635[1]. During their occupation this family had gained enormous wealth. Both brothers had been created counts in Spain, and had built a street in Madrid[2] which still bears their name; but they had transmitted the greater part of their wealth to their paternal country, Germany, where families created in this way still flourish as mediatised princes, with extensive landed property.

The mines continued in a neglected state till 1690, when a Jew named Gomez obtained a grant of it from King Charles the Second, and formed a company consisting of Portuguese of his own nation. They attempted to drain the chief mine, the *Pozo Rico* or rich pit; but from want of sufficient capital to construct engines, and from the unskilfulness of the workmen they had engaged, they failed in their attempt. Gomez was charged with duplicity, was arrested, and a long time imprisoned at Seville whilst his cause was proceeding in the courts of law, and at length he died before its termination.

Whilst the persecution of the unfortunate Jew was carried on, it was thought necessary to show

[1] Historia Naturel, por Guillermo Bowles, p. 16 and 62.

[2] The street is called Calle Fucares.

his guilt by setting the mines to work, and thus, by proving their productiveness, prove his criminality. The crown undertook the work, and Don Alonzo Carillo Rueda of the council of finances was appointed superintendent, accompanied by a wandering friar, who having resided some time in America was supposed to be capable of performing the duties of an engineer. After a few years, with little progress in draining, sickness, want of money, and other impediments baffled all attempts to reach the metals. The mine was once more abandoned, and Carillo with his officers and retinue returned to Madrid, to the loss of the crown and to the disappointment of the ministers.

The war of the succession which soon followed suspended all mining projects; but in 1728 a new adventurer under took the work of opening the mines of Guadalcanal. This was an English woman of rank—Lady Mary Herbert, daughter of the Marquis of Powis. She had resided in Paris, had been connected with the celebrated Missisippi Law, and had thereby improved a natural talent and disposition for enterprises of an extensive nature. This lady was received with attention in Spain, and a company which had been formed two years before accepted a proposal she made to drain the mines of Guadalcanal. The conditions were that she was to be paid two hundred thousand dollars

by instalments as the work advanced, and to receive one half the profit of the mine.

Lady Mary departed from Madrid for Guadalcanal, to which miners and engines had been sent from England at her expense, and at that of her relation Mr. Gage, who accompanied her, and of her father the marquis. The instalments were paid regularly by the company, and the draining of the mines proceeded simultaneously, when disputes arose. The Spaniards insisted that the lady had engaged to clear away the mud, whilst she contended that she had only contracted to clear the mine of water. A lawsuit was instituted, and the payments of the company were suspended.

Her ladyship now prosecuted the work on her own account, and advanced to a depth in which the richest minerals were supposed to be; when she presented a judicial request that a portion of the ore should be taken up, smelted in the presence of the court, and its value ascertained and attested. A decree was issued appointing the examination. Ore of the weight of forty pounds was taken from one of the galleries, which produced ten pounds thirteen ounces of pure silver. This specimen, which was handed about in a very ostentatious manner and shown to the king, who happened at that time to be at Seville, seemed to justify beyond all doubt the reputation of the mine for great riches. It was, however,

asserted, that as all the agents employed by the lady were foreigners, imposition had been practised on the judges and officers of the court, on the Spanish agents, and on the numerous witnesses who were present at the examination.

During two years, whilst a suit thus occasioned was proceeding, the expense of keeping those galleries that had been drained clear of water was too great to be borne, and they became filled again. Lady Mary, however, at length, by her interest at court, obtained a decree in her favour: the mines were adjudged to her and her heirs for a term of thirty years, on condition of working them within two years at her own expense. She never, however, appeared afterwards in the business, though agents said to have been employed by her spared no pains to engage new adventurers to contribute to form a fund for prosecuting the work.

Mr. Gage, the relation and partner of this lady, then obtained a grant of the mine from the crown in his own name in 1736, and continued to work it during ten years; and though he procured some rich ores which yielded considerable quantities of silver, it never equalled the expenditure—besides which the plunder of the agents, after the death of Mr. Richard Westley, the chief of them, augmented the loss and closed the whole operation.

After that Mr. Thomas Sutton, created Count

de Clonard, formed a company in Paris, and obtained a grant of the mines in 1768. After erecting hydraulic machines, and proceeding with the drainage seven years, they discovered that the vein was in another shaft than that on which they had been operating. This company, like the others, dissipated the capital with no other fruits than some curious mineralogical specimens, with which the cabinet of natural history in Madrid was enriched.

Whoever may have attended much to the history of mining, especially for the precious metals, must have seen for the most part similar displays of high expectation followed by disappointment, and of real wealth squandered in the vain pursuit of that which existed only in the sanguine imaginations of wild projectors. When, a few years afterwards, the mines of Guadalcanal were noticed by Dillon, they yielded ores to some small extent; but at present they are in a neglected state, and have been so during the last thirty or forty years. It is, however, probable that the mines of lead in Andalusia, which Spain is now working successfully, and which have lowered the price of that metal in every part of Europe, may produce greater advantage to her than that country ever drew from her lauded mines of silver and gold in the most prosperous times.

It is asserted by Pliny in the second book, and

before noticed in this inquiry, that Asturia, Lusitania, and Galicia furnished annually twenty thousand pounds of gold. This may be an error or an exaggeration, or a mistake in the Roman numerals; but there is no ground for believing that any mines of gold were found, the workings of which were constantly proceeding; for in every instance of which we have any accurate information, when gold has been found in mines, it has been speedily exhausted. The gold furnished by the Spanish peninsula to its Roman masters, be it as much as Pliny states, or only a portion of that quantity, was most probably supplied by washing the sand of the streams. This we may infer from the name given to several of the rivers, such as the Duero and the Darro, both of which yielded gold under the Moorish domination, as did many others, as well as their contributory brooks.

In a country like Spain, where the necessaries of life are to be procured with but little labour, where both under the Romans and the Arabs their rulers had unlimited power, and the great body of the people no means of resisting the most oppressive commands, a very great number of persons might be employed in searching for gold; and though under other circumstances that labour might have been applied to more beneficial purposes, yet none would be so captivating to the ambitious and greedy governors.

It is then possible that, by such means as they possessed, the Roman and the Arab chiefs were able to extract by washing the sand a greater portion of gold than can now be obtained by the more mild and better regulated governments of modern Europe.

We find, accordingly[1], that in 938 the Arabian viceroy Abdoulrahman sent a present to the caliph which, among other valuables, consisted of four hundred pounds of virgin gold, and the value of four hundred and twenty thousand sequins (about twenty-one thousand pounds sterling) in silver. But the viceroy had ruled Spain twenty years at that time, and in such a period it must, with the number of christian slaves he could command, have been easy to have collected such a quantity.

No notices in ancient writings have been discovered of mines of the precious metals in Portugal distinct from those of Spain. Both the Romans and Moors considered Portugal, under the name of Lusitania, as a province of Spain, and the productions of the two countries are blended together. No modern writer has noticed mines of silver, and only one has made mention of gold. It is at a place called Adissa, in the district of St. Ubes. We have no accounts of its origin or past condition, but recently it has been

[1] Cardonne, vol. i. p. 320.

worked through the summer months, and only four or five workmen are employed in the winter. The produce, as stated to M. Balbi by Vandelli, director of the mines of the kingdom, is small; being, in the year 1815, 41lbs. of pure gold; in 1816, 18lbs.; in 1817, 11lbs.; in 1818, 12lbs.; in 1819, 13lbs.; in 1820, 12lbs.; and in 1821, 18lbs[1].

Northern nations.

The northern nations of Europe appear to have possessed more gold and silver than was to be found in Germany, France, or the British Isles in the middle ages. The Danes or Normen, who subdued several of the countries to the south of them, and committed extensive piracies on others, had been enabled to collect a quantity of treasure, much of which was expended in ornamenting their arms, and in decorating the vessels which they equipped for their several predatory expeditions.

We have in an anonymous writer, a contemporary of Canute, a description in the Latin language of the fleet with which that prince sailed to take possession of the throne of England[2]. It is entitled "A Panegyric on Emma, Queen of England," who was the wife of Canute. "On the stern of the ships," he says, "lions of molten

[1] Essai Statistique sur le Royaume de Portugal, par Adrien Balbi, vol. i. p. 136.

[2] Emmæ, Anglorum Reginæ Encomium, p. 166—168.

gold were to be seen; and on the mast-heads were either birds whose turning showed the changes of the wind, or dragons of various forms which threatened to breathe out fire. There were to be seen human figures looking like life glittering with gold and silver. Dolphins also were seen of precious cast metal, and centaurs that brought to remembrance the ancient fables. But how shall I describe the sides of the vessels, which were not only painted with various colours, but swelled out with gold and silver ornaments? The royal ship surpassed all the others as far as the king in his appearance exceeded his soldiers." In a subsequent passage, book ii. when describing the landing, he says, "The ships were so splendid that they seemed a flame of fire, and blinded the eyes of the spectators: the gold glittered on the sides, and the wrought silver work also that was mingled with it. Who could look upon the lions of shining gold, who on the human figures of cast electrum with their golden faces, who on the dragons gleaming with brilliant gold—who could look on the carved oxen that threatened death with their golden horns—who could behold all these objects without fearing a king possessed of such might?"

There can be no doubt but some of the wealth thus employed may have been acquired from England and from France, who were each at times induced to pay a tribute to the invading

Normen, rather than have their dominions laid waste by the extension of their rapine. Thus, as early as the year 845, a fleet of Danes or Norwegians sailed up the Seine to Paris, when Charles the Bold was induced to pay them fourteen thousand marcs of gold; which, says Voltaire in his General History of Europe, only emboldened them the more. In England, during the reign of Ethelred, a bribe of ten thousand pounds was paid to the Danes to induce them to desist from an invasion and to depart the kingdom; and a few years later that king paid to Sweyn and Olave, who had established themselves at Southampton, sixteen thousand pounds on condition of their leaving the kingdom. About ten years afterwards the same prince purchased another temporary peace at the expense of thirty thousand pounds, and at the end of the next four years renewed the vain attempt by a tribute of forty-eight thousand pounds. This last payment was followed twelve years later by a transfer of the crown of England to Canute the Dane.

Another mode by which these sea kings, as they are called by their own countrymen, obtained the precious metals, or at least gold, is described by Adam of Bremen, who about the year 1080 wrote his work "*De Situ Danæ, et Reliquarum septentrionalium Regionum.*" That author, without taking any notice of Copenhagen,

which probably was not then in existence, describes the towns of Aarhusen and Aalberg in Jutland, and of Lunden in the island of Schönen, saying of the latter place, "It is a city in which there is much gold, which is procured by those incursions on the barbarous nations on the shores of the Baltic sea, which are tolerated and encouraged by the King of Denmark on account of the tribute he draws from them."

It would appear that the inhabitants on the shores of the Baltic, from whom this gold was obtained either by traffic or by force, must have been supplied from mines or washing either in Norway or Sweden, or from the more remote country of Russia.

We have very imperfect accounts of any mines in Norway and Sweden: they are mostly such as have been collected by modern travellers, who, from being natives of other countries, refer rather to the condition in which they found them than to any historical documents descriptive of the ancient state. M. Jars[1] says, "The vestiges of gold are found in great numbers, and almost without trouble, in the mines of silver, copper, and other metals at Fahlun, Helfors, and other parts of Sweden." (P. 65.) The principal mines of gold in former times were those of Asheda in Smaland. These were

[1] Voyages Metallurgiques, vol. i. p. 65.

worked in the reign of King John the Third by one Henry Lejel, to whom at length the king conveyed them, but of late years they seem to have been neglected[1]. In Norway the same author speaks of a gold mine which had been known in ancient times, had been again latterly worked for ten years, but then abandoned because the produce did not cover the expenses.

The silver mines of Sweden and Norway have continued to be somewhat more productive than those of gold, but even these are now, and probably have ever been, but of small amount. The silver mine of Sahl or Sala is said to have been worked five hundred years ago[2], and to have yielded in 1506 thirty-five thousand marcs, but to have been revived only so late as 1623; and now, according to Crome, it yields 1700 marcs annually[3]. The net profit of this mine in 1767, according to the account of Jars, did not exceed five thousand livres; but that seems to have arisen from some extra temporary expenses, incurred by making or extending a canal to drain the mine.

[1] The Swedish mine at Adelfors yielded in 1736 twelve marcs of gold, each marc being eight ounces. It was not quite sufficient to defray the expenses, on which account a motion was made in the senate to relinquish the working it.

[2] Travels of A. de la Motraye in 1711, vol. ii.

[3] Crome, Uebersicht der Staatskräfte von den Europaischen Reichen und Landen, p. 123.

Two other mines were worked in Sweden in 1711, one at Mont d'Argent Oriental, the other at Mont d'Argent Occidental, in the parish of Norberk. These are stated to have yielded half a ducat of pure gold to each quintal of silver; and Jars also states, that many other mines of silver were formerly worked in the same vicinity. The silver mine of Kongsberg in Norway was scarcely known before 1623. Since that period, much expense has been incurred and many mechanical experiments tried; but the variations in the produce have been very great, and the demands for fresh capital very frequent. After sixty years' working and great expenditure, the disbursements and the produce were brought to balance each other. In some years between 1710 and 1767 the mines paid a large profit, but in some others occasioned a heavy loss to the crown, who is or was the proprietor. The works had been suspended on account of some great requisite demands for new shafts, but it caused so much distress in the immediate neighbourhood that the Storthing in 1815 again decreed the working, with what success is unknown. According to traditionary reports, the mine was very productive in remote ages.

It is not impossible that some of the gold which was found among the Danes and Norwegians in ancient times might be the produce

of Russia, where mines of it had been wrought in the times of high antiquity, though they had for some centuries ceased to yield any produce till they were revived again under Peter the Great, in 1699. Notwithstanding the distance, the compendious value of gold may have made it transferable to Denmark, with which country all others are said to have had a great trade. Helmoldus, in his *Chronicon Sclavicum, lib. iii.* says, "The people of Denmark abounded in all riches, the wealthy being clothed not only in various sorts of scarlet, but also in purple and fine linen (nunc non solum scarlatica vario grisio, sed purpuræ et bysso induuntur), occasioned," as he adds, "by the fishery of herrings which is carried on on the shores of Schonen; whither traders of all nations resorting, bring with them gold, silver, and other commodities for purchasing the fish."

Great Britain and Ireland.

These islands do not appear at any time to have contributed very largely to the general stock of the precious metals of the world. Yet the report of the riches of the mines was made use of by the Roman commanders to stimulate their troops to battle. Agricola, in his oration, before the battle of the Grampian mountains, reminded his soldiers of the riches which were to reward their valour. "Fert Britania aurum et argentum et alia metalla pretium victoriæ."

"These metals have in later times been obtained in quantities sufficient to prove, that they might at an earlier period have been an object worthy of conquest. In the reigns of James the Fourth and Fifth of Scotland, vast wealth was procured in the lead hills from the gold collected from the sand washed from the mountains. In the reign of the latter, not less than to the value of three hundred thousand pounds sterling. In another place, a piece of thirty ounces' weight was found. Much also was obtained in the time of the Regent Morton. The search is now given over, but bits are still found accidentally. Lord Hopton, owner of the lead hills, is in possession of a specimen that weighs an ounce and a half.

"Gold is to this day found in Cornwall mixed with tin and other substances. The largest piece that has yet been discovered is equal in weight to three guineas. It is probable that it was the Cornish gold which proved the lure to the Romans; for it was impossible they or the Phœnicians could be ignorant of it, who had such long commerce with the country, and who were acquainted with the manner of obtaining it."

"In the reigns of Edward the First and Third, there were very considerable works at Combmartin in Devonshire: three hundred and thirty-seven miners, sent for out of Derbyshire,

were employed in them, and the produce was so great as to assist Edward the Third to carry on the war with France[1]."

One Bulmar, an Englishman, worked the gold mines in Scotland in the reign of Queen Elizabeth. In that time three hundred men were employed near Elvansfoot, at a place still called the Gold-Scour, who, in the course of a few summers, are said to have collected equal to the value of £100,000[2]: they were resumed a few years ago under the superintendence of the manager of the lead mines at Wanlochhead; but the price of labour was too high to induce the continuance of the workings[3].

Fabricius, professor of mineralogy in the university of Kiel in Holstein, visited England about the year 1740, chiefly with a view to examine the state of the mines. He says in his work on the subject[4], that in the tenth year of Queen Elizabeth, miners were sent from Germany to the company of mines royal established to work the mines of silver in Cardiganshire, and those in the county of Tipperary in Ireland. As far as relates to gold and silver, his informa-

[1] Pennant's Wales, vol. i. p. 90, 91.

[2] William's History of the Mineral Kingdom, vol. ii. p. 365. Edinburgh, 1810.

[3] Ibid. vol. ii. p. 364.

[4] Reise von J. C. Fabricius durch verschiedene provinzen in England und Schotland.

tion is confined exclusively to Scotland. Near Glasgow, at Crawford Moor, he learned that gold had been found there in the reigns of Queen Elizabeth and King James the First; and that Sir John Erskine with four others, had formed a plan for working the mines again. This Sir John Erskine was also a proprietor of mines of silver at Alva, which had ceased to be worked in 1720, having been for six years before carried on under the direction of one Peek, an Englishman. Some silver mines near Linlithgow had been worked in the reign of Mary Stuart, but had been long abandoned; and another about ten miles from Edinburgh, whose ore in the year 1607 had yielded from each quintal twenty-two ounces of pure silver, had been long abandoned. The professor notices also the gold mine belonging to Lord Hopton, near Moffat, which, he says, had been worked one hundred and fifty years before the time that he was in Scotland.

We have now no knowledge of the mines of silver in the county of Tipperary in Ireland, which the mines royal company are said to have employed Germans to work. About the year 1796, some stir was made in Ireland by gold having been found in the alluvial soil of the county of Wicklow, where some specimens of a large size were discovered; but though gold to the value of ten thousand pounds was obtained,

the whole cost of the labour far exceeded that sum [1].

The space whence the gold was collected is of very limited extent, not exceeding 350 yards along the banks of a brook not more than six or seven feet wide, which before the operations commenced had formed a channel down to the bed of rock. The banks of this stream are composed of a stratum of sand and gravel about five feet thick, which reposes on a rock of argillaceous schist, and which latter is intersected by veins of quartz. It is from the sandy stratum that the particles of gold were extracted by washing.

The ore was so pure, that twenty-four grains contained but one grain and a half of alloy. The greater part was entirely free from stony matter; but some of it was attached to quartz or a fine grained iron stone, and sometimes disseminated in other minerals. One of the masses weighed five ounces, and another twenty-two ounces, the latter of which is said to be the largest specimen of native gold ever discovered in Europe [2].

The ancient laws of England were calculated to discourage every branch of mining except that of iron. From the time of the conquest,

[1] William's Mineral History, vol. ii. p. 367.

[2] Fraser's Wicklow, p. 19.

the crown, by virtue of the royal prerogative, assumed the entire right to all mines and minerals. It had been customary to issue grants from the crown during the period which extends from the reign of Edward the First to that of Henry the Seventh, by which several persons were empowered to search for ores. These grants were limited, some being confined to particular counties, some to districts, and a few extending to the whole kingdom. The only restriction was one forbidding the works to be carried on under castles or houses, gardens, and orchards, the owners of which were to be indemnified for any injury they might sustain. In letters patent granted by Richard the Second, to Richard Wake, authorising him to search for mines of gold and silver in the county of Devon during ten years, he has unlimited power to dig in all liberties on paying for any damages he might commit, but on condition of his rendering one-tenth of the profit of the mines to holy church, and one-ninth part to the Exchequer.

There are records as early as the reign of Edward the First, which show that tithes of minerals were then paid. That prince directed the same proportion of the produce of the mines to be paid to the parochial churches in Wales; and the Abbey of Basingwert derived a revenue from the same source.

It does not appear in the remote ages of our

history, that the owner of the land on which mines were discovered had a right to any portion of the mineral products before the fifth year of Henry sixth, (1426). At that date the Duke of Bedford, then regent of France, received a lease for ten years of all the mines of gold and silver in the kingdom of England, on condition of paying one-tenth to holy church, a fifteenth to the king, and a twentieth to the lord of the soil.

When Henry had arrived at maturity he continued mineral grants to several of his nobles; among others to the Earls of Warwick and Northumberland, and to his brother Richard, Earl of Gloster; but in these the terms were varied. They were to pay to the king one-eighth of the profit, to the lord of the soil one-ninth, and to the parish priest one-tenth.

Henry the Seventh, at the commencement of his reign, appointed Jasper, Duke of Bedford, and several other persons of high rank, governors of all the mines in England and Wales; paying to the king the fifteenth part of the *pure* gold and silver, and to the lord of the soil the eleventh part *as it grows;* meaning probably that portion of the crude ore.

In the early part of the reign of Elizabeth, attention to mining was greatly revived. A corporation was formed bearing the title of the *mines royal society.* The first governor was

William, Earl of Pembroke, with whom were joined in the commission, as assistants, several men of high rank, some citizens and some foreigners of supposed experience in what related to the operations of mining. About the same time (1567), another corporation was formed for converting the metals into articles for useful domestic purposes, designated as the *society for the minerals and battery works.*

Elizabeth, who resolutely maintained all the prerogatives of the crown, granted, in the most extensive manner, the power of sinking shafts and building houses, not only on the royal demesnes, but on the land of any of her subjects. Thomas, Earl of Northumberland, to whom the manor of Keswick had been granted by the crown, resisted this claim to the copper mines on that estate; but a decision was made against him, on the ground that the crown had not the power of alienating the minerals which were inseparably linked to the prerogative of the monarch. This was deduced from the king's right of coinage, from which, however, only his right to the precious metals from which money was formed can be inferred.

Two opinions on this subject were contended for by different legal persons. Some maintained, that if any gold or silver was found in the mines of baser metals, the whole would belong to the king; which, in fact, was bestowing all the

mineral property on the crown, there being scarcely any base metal but what holds some particles of the nobler metals. The others, however, but at a later period, qualify their opinion, by saying, "That although the gold or silver contained in the base metal of a mine, in the hands of a subject, be of less value than the base metal, yet if the gold or silver do countervail the charge of refining it, or be of more worth than the base metal spent in refining it, *this is a royal mine;* and as well the base metal as the gold and silver in it belong to the prerogative of the crown[1]."

Immediately after the revolution, the crown, by an act passed the first year of William and Mary, relinquished all claims to the mines of copper, tin, iron, and lead, although gold or silver might be extracted from them in any quantities. By a subsequent act, which confirmed the former, the crown reserved a right to purchase within thirty days after raising all ore made merchantable at the following rates, viz., copper at £16 per ton; lead at £9; and tin at £40; and in default of such payment the owners were at liberty to dispose of their ore as they pleased.

Thus, though an appearance of right has been

[1] This opinion was given in the year 1640, and subscribed by Maynard and others, the first lawyers of that period.

reserved to the crown, yet the business of mining has been practically free from restrictions, though not from some antiquated trammels [1].

The trammels which the feudal system had imposed must naturally have operated as an obstacle to the extension of all those domestic articles which are composed chiefly of mineral substances. The partial removal of those trammels under Elizabeth and the establishment of manufactures, though by a kind of corporate body, produced some considerable beneficial effects. Before her time our acquaintance with minerals was almost lost, and the manufactures which depended on them were either abandoned or in a state of decay.

At the commencement of that reign, we imported from Germany, through the ports in the Netherlands, our swords, knives, stirrups, bits, and even our pins, as well as all our articles of brass and copper, and also our wire, excepting a small quantity which was worked by hand. That penetrating princess invited to her dominions foreign miners, foreign smelters, and foreign artificers of metallic productions; and, having prohibited the importation of metal goods, in a few years the inhabitants were supplied with

[1] The greater part of this history of the law relating to mines in England has been abridged from the account given by Pennant, vol. i. p. 101, et sequitur.

almost every description of hardware from the product and labour of their own land.

The first step was thus gained, and the progress since has been accompanied by so much talent, assiduity, and attention, that at length we have surpassed our former continental instructors, and been enabled to supply the wants, as they arose, of the greater part of the more civilized and more wealthy inhabitants of other countries.

If Elizabeth, instead of addressing her efforts towards the inferior metals, had, like most of her predecessors, directed the attention of her subjects to the search for gold and silver, she might, like some of them, have obtained small portions of those metals to supply her mints, but at a cost to herself or her people far beyond the value of the products; and she would have suspended if not prevented those proceedings in quest of iron, copper, lead, and tin, whose subsequent workings have enriched thousands, and whose labour has afforded employment and sustenance to millions in successive generations.

CHAPTER XI.

On the consumption of gold and silver in the centuries from the conclusion of the western empire to the discovery of America.

THE manners of a society must necessarily have a vast influence on the consumption of the precious metals which exist within it. In the age of Charlemagne and in those of his successors during the following centuries, both the monarchs and their most powerful nobles were the great proprietors of the soil, and cultivated it for the maintenance of their households, by means of various descriptions of vassals, who, however distinguished by the greater or less degree of severity of their servitude, were in a condition little better than that of slaves. Every thing required for the domestic establishments of even monarchs themselves, with the exception of a few foreign luxuries, was drawn from their own farms, and their ordinary clothing was made in their own houses; and thus it became convenient to them to live, as they chiefly did, on their estates. From this mode of subsisting

there could be little occasion for money, and as there was but little circulation, there could be no great loss by wear when compared with the quantity of it actually in existence. As the low prices of all commodities had accompanied or followed the diminution of the stock of gold and silver, the few articles that were purchased by the great mass of the people had fallen to such an extent, that no piece of gold or even of silver could be so small as to pay for what labourers needed for their daily subsistence. When a loaf of bread sufficient for a week's consumption for a man could be bought for a farthing, silver money could not be used in the transaction; to say nothing of the case of one who wished to purchase food for a day.

The current money must then have been composed of the inferior metals, copper, tin, or iron; consequently but little loss on gold and silver would arise in the way which constantly occurs on those metals at present. Gold and silver would only be needed in the larger operations of commerce, and chiefly in that branch which consisted in furnishing such commodities as were required for military purposes.

The taste and tendency of those ages were averse to commerce. Every free man felt it disgraceful to meddle with trade either foreign or domestic, or to occupy his attention with any

other pursuit than that of arms. Hence, the commerce of Europe fell almost exclusively into the hands of the Jews, who, though sometimes persecuted, were sometimes caressed by the monarchs and the nobles; and were, in fact, the chief depositaries of the treasures of gold and silver.

Although in the ninth and tenth centuries, the names of Bordenwick, Magdeburg, Erfort, Forscheim, and Ratisbonne, occur as trading cities; there seems reason to conclude that the chief business in them was conducted by the Jews. The fairs and markets that were established for purposes of trade were fixed at places and in situations which were deemed by those people most adapted for their convenient resort.

An author of the ninth century, who affirms this, complains of the Jews that "their riches and their pride had so increased, under the feeble reign of Louis the First of France, that both had attained their highest pitch. They obtained for money whatever they desired, and even succeeded to such an extent, that the priests were forbidden to baptize their domestics without previously obtaining the consent of their masters. The principal persons of the court, whose money was diminished, and whose wants increased, sought their friendship, and

even the chief bodies made presents of dresses to the wives of the Jews[1]."

In spite of the temporary influence this tribe might attain, and of the occasional blandishments which were sometimes lavished on them, they must have lived in a state of constant apprehension if not of terror. This would induce them to adopt secret repositories to secure their more compendious riches; and, accordingly we find, that both threats and personal inflictions were frequently applied to extort from them their stores of hidden wealth. That part which was withdrawn from circulation and preserved in concealment, probably the most valuable part, would thereby be kept from that consumption by friction to which a quick circulation always exposes the coin. It is in this way that we may account for the existence of so many of the gold bezants in the west of Europe, many centuries after that particular coinage had ceased.

It is further to be observed, that the coinage of the middle ages was conducted with little skill and still less taste. The operation had been rendered hereditary in certain families who were answerable for the intrinsic value of the pieces they issued, but troubled themselves

[1] Agobardus. De Insolentia Judeorum, p. 144.

very little about their beauty, being only compelled to stamp on them the name of the reigning sovereign. On account of the scarcity of silver about the year 1213, the emperor of Germany established numerous mints[1] in several cities, and, that the moneyers might practise no deceit, a number of persons were placed in each under the title of *adjoints*, whose duty it was to buy and receive the metals, to watch carefully all the transactions regarding the real value of

[1] In England, in the establishment of a great number of mints, the practice of the continent was adopted. During the reign of Ethelred, who died in 1017, there were mints in the following towns: Bath, Bristol, Bedford, Buckingham, Cambridge, Canterbury, Chester, Chichester, Derby, Dover, Exeter, Gloucester, Huntingdon, Hertford, Ilchester, Ipswich, Leicester, Lewes, Lincoln, London, Lydford, Maldon, Norwich, Oxford, Reading, Rochester, Shaftesbury, Shrewsbury, Stafford, Stamford, Stanwin, Sudbury, Wallingford, Wareham, Watchat, Wilton, Winchester, and Worcester.

The moneyers, as designated by the initials of their names in the reverses of the coins, amounted to no less than two hundred and forty-three[2].

After the Norman conquest, both the mints and the moneyers were much reduced in number, so that in the reign of Henry VI., who died in 1461, the only mints in England were at Bristol, Canterbury, Coventry, Durham, London, Norwich, Oxford, and York. In the reign of Henry VII., these were again lessened, and only Canterbury, Durham, York, and London, continued to coin. In the reign of Edward VI. the mint at Durham had ceased to work. In the reign of Elizabeth, all the coin was struck in London, and no traces of the other mints are to be found from that time.

[2] Ruding's Annals of the Coinage, vol. i. p. 269.

the coins, and especially of those of inferior standard, but, above all, to superintend the securing those emoluments to the emperor to which he was entitled for his seigniorage. Those precautions were found, however, so ineffectual, that it became necessary to issue penal ordinances, by which the punishment of the galleys in some cases, and of death in others, was decreed[1].

Without farther mention of the productions of the mints in the middle ages, it is sufficient to observe, that the coins of that period being clumsily formed were thicker than those of more recent date, and as they thus exposed a much less surface to friction, there was proportionably less loss on them than on modern pieces of money.

There is good reason to conclude, that during the period we are viewing a very small part of the produce of the mines of gold and silver was permanently applied to other purposes than that of money. A portion of it was undoubtedly used for domestic utensils, for religious institutions, and for personal decorations; but it would appear that such portions were small and dispersed among the higher classes of society, including the ecclesiastical communities, in very

[1] Schmidt, Histoire des Allemands, vol. ii. p. 389, and vol. iv. p. 27. Edition Liege, 1784.

small quantities. We should be justified in concluding, that whatever existed in other forms than that of money, was, with the money, held to be at the disposition of the government whenever the necessities of the public required it to be put in requisition. Thus, when Richard king of England was a prisoner in Austria, Louis of France in Egypt, and John of France in England, their redemption was effected by placing in requisition, as has been already noticed, the plate of noble individuals and of religious houses in all parts of their dominions. The gold and silver articles, of whatever kind, so collected, would be converted into coin either by those who delivered or those who received them, and become a part of the general mass of current money. In more tranquil seasons, when peace gave a breathing time for the indulgence of luxuries, the coin might and probably would be reconverted into objects of gratification. These changes might increase the waste of both metals. As far as relates to silver, there is a small portion of waste at every melting; and though gold suffers no loss by that operation, yet, in its application to objects of personal decoration, it is divided into such small particles that some of them, from their very minuteness, become insensibly mixed up in other substances, from which they are only separated

at an expense of time and labour which exceeds their value.

In some of the ancient chronicles, notices are to be found which would give a higher value to the stock of silver and gold in the possession of some individuals than appears to be justified by a more rigid examination. In the gold, silver, and jewels, taken from Piers Gaveston, the favourite of Edward II., it is said by Rymer, that some of the silver articles in his collection had cost four times the value of the metal in workmanship. The workmen on the precious metals, except, perhaps, on the inferior parts of the work, were not mere mechanics, but men of a superior order, like artists, such as Cellini in Italy at a later period. Among the operators on gold and silver in England, we find several ecclesiastics noticed, especially one Alan de Walsingham [1], a monk of Ely, who as well as others of his class were celebrated for their superior skill in the goldsmith's art. Whilst the fabrication of any articles is confined to artists, they must necessarily be rare; and when they become subjects of extensive demand and use, the labour will be executed by common mechanics or manufacturers. In that now usual appendage to the dress of almost every decent person, the

[1] Walpole's Anecdotes of Painting, vol. i. cap. 20.

watch, though it had been introduced as early as the beginning of the fourteenth century, only the outer case was made of silver and the inner one of copper, and a gold watch was not known till a period long subsequent to the first invention. As far as is known of the jewelry of that day it appears to have derived its great value from the precious stones, and in a very small degree from the gold or silver in which it was fixed. Thus when our Henry the Third pawned his jewels for five thousand marcs, or ten thousand pounds, to the king of France in 1261, the gold of the rings, in number three hundred and twenty-four, however heavy they may have been, could have borne no proportion in value to the sum borrowed, the security for which must have been founded on the precious stones.

From the great value thus created in articles of which gold and silver bore a part, we infer that great care must have been taken of their preservation, and that the articles of silver whose value was increased by the costly workmanship, and those of gold by the stones imbedded in it, were rarely used, and that consequently there was but little loss occasioned by that degree of friction to which they were exposed.

The art of gilding and plating had been carried to some considerable extent, and the metal which was thinly coated with gold or silver was

fraudulently sold for those metals. To prevent such frauds, and also to prevent the use or waste of too much gold and silver as the preamble recites, the act of the fifth Henry the 4th, cap. 13, was passed, which enacts "that no artificer or other man shall henceforth gild or silver any locks, rings, beads, candlesticks, harness of girdles, chalices, hilts, nor pummels of swords, nor covers for cups made of copper or latten, upon pain to forfeit to the king one hundred shillings; but that the said artificers may work (chalices excepted) ornaments for the church of copper and latten, and gild or silver the same; so that always on the foot or some other part the copper or the latten shall be plain, to the intent that a man may see whereof the thing is made for to eschew the deceit thereof."

We conclude therefore, that during the period in question, there could be but little consumption of the gold and silver which composed the money; or of that used as utensils or ornaments in an unmixed state; but that, up to passing the act quoted in the year 1403, there must have been a considerable quantity consumed by gilding and plating on the inferior metals.

CHAPTER XII.

On the effect of the decrease of the precious metals on the prices of commodities in the period extending from the dissolution of the Western Roman Empire to the discovery of America.

THE scattered fragments of information which may be collected by diligent research respecting the attempts to obtain the precious metals from the bowels of the earth are chiefly of importance to the purpose of this inquiry, because they lead to the inference that no great increase or diminution, in the actual quantity of those metals, took place in the middle ages.

At the period when the mines in Hungary and Germany began to be worked, or as regards the former, recommenced their workings, it has been hypothetically assumed that the whole quantity of coined money amounted to not more than about thirty-three or thirty-four millions sterling.

If we suppose the same rate of consumption to have proceeded as at the former periods, we shall find that to replace that loss by wear which would have required in the time of Augustus at least an annual supply of one million sterling,

there would in the eighth century be only a supply of one tenth of that amount demanded. In fact, one hundred thousand pounds extracted from the mines and converted into coin in the eighth century would, on the supposition here assumed, have been as adequate to the effect of maintaining an equilibrium on the price of commodities as a million sterling would have been in the first century.

There are no means by which to mark the several steps of the depression of prices which accompanied the gradual consumption of the precious metals between the first and the ninth century; and even in the ages that followed, the facts are scattered among so vast a mass of documents, and the variations in the real value of the nominal money were so great, that though the influence of the destruction of the precious metals on the depression of price can admit of no doubt, yet that influence can only be calculated in a way far from distinct and exact.

If we take a view of Europe during the existence of the Saxon heptarchy in England, we shall probably find the scarcity of money and the depression of prices to have reached the lowest point. The Romans in abandoning Britain, Gaul, and the other western portions of the dominions, over which their power had once extended, had carried with them all that was most portable and valuable.

Britain especially was so exhausted of the precious metals in the form of money, that in trafficking, what the Saxon writers call *living money* was usual and legal. "This consisted of slaves and cattle of all kinds which had a value set upon them by law, at which they passed current in the payment of debts and the purchase of commodities of all kinds, and supplied the deficiency of money properly so called." "Thus for example, when a person owed another a certain sum of money, which he had not a sufficient quantity of coin to pay, he supplied that deficiency by giving a certain number of slaves, horses, cows or sheep, at the rate set upon them by law; when they passed for money to make up the sum. All kinds of mulcts imposed by the state or penances by the church might have been paid either in dead or living money, as was most convenient; with this single exception, that the church, designing to discourage slavery, refused to accept slaves as money in the payment of penances[1]." "In those parts of Britain where coins were very scarce, almost all debts were paid and purchases made with living money. This was so much the case both in Scotland and Wales, that it is much doubted if any coins were struck in those countries in the Saxon period[2]."

[1] Henry's History of Britain, v. iv. p. 243. [2] Ibid. p. 244.

We select a few facts to show how very small must have been the quantity of money at that period in Britain, and how very low was the metallic valuation of every description of property.

The gold coin which circulated in Britain was almost exclusively that struck by the Romans at Constantinople, the larger pieces of which derived their name of Bezants or Byzants from that city. A pound of gold was coined into seventy-two of these pieces. The celebrated St. Dunstan purchased of king Edward the manor of Hendon, in Middlesex, about the year 960, for two hundred bezants, or a little more than three pounds' weight of gold, which would make the cost of that manor one hundred and forty or fifty pounds; certainly not one hundredth, scarcely one thousandth part of its present value in gold[1].

Alfred the Great was one of the richest princes of the age, but he bequeathed by his will five hundred pounds only to each of his sons, and one hundred pounds to each of his three daughters. As the Saxon pound weight of silver, the money here spoken of, was 5400 grains, it may be valued at two pounds sixteen shillings of our present money, thus making the legacies to the sons fourteen hundred pounds, and those to the daughters two hundred and eighty pounds[2].

[1] Camden's Remains, p. 182.

[2] Testamentum Ælfredi apud Assar, p. 23.

In Wilkins' Leges Saxon. as quoted by Dr. Henry, we have prices of various articles in England in the reign of Ethelred about the year 997, which the learned Doctor has calculated with great correctness in money of the present time.

Price of a man or slave	£2	16	3	sterling.
a horse	1	15	2	
a mare or colt	1	3	5	
an ass or mule	0	14	1	
an ox	0	7	0½	
a cow	0	6	2	
a swine	0	1	10½	
a sheep	0	1	2	
a goat	0	0	4½	

Though the money prices of that description of property which the nobles chiefly possessed were thus low, they do not appear to have rendered them less attached to their rural gratifications or less tenacious of their exclusive rights to them than their successors of the present generation. Such was their eagerness for field sports that the price of a hawk or a greyhound was the same as that of a man, and the robbing a hawk's nest was as great a crime in the eye of the law as the murder of a human being.

The vast amount, in proportion to the whole quantity of coin in circulation, which Ethelred paid as tribute to the Danes, and which so exhausted England as to compel her to submit to

the monarchy of Canute, may have made money more scarce in this island than in the neighbouring countries on the continent. It does, however, appear that with them a great scarcity was felt. It may not warrant the conclusion to which Dr. Henry arrives, "that there was not one fifteenth part of the cash in England at any one time during the period between the arrival of the Saxons and the Norman conquest that is in it at present; and that this observation may be extended to almost every other country of Europe[1]." We are rather inclined to think that the money in western Europe must have been from a twelfth to a fifteenth of the present stock, and that a larger portion was accumulated in the eastern part of Europe, and especially at Constantinople, the seat of the remnant of the Roman power, where it remained, or at least a large proportion of it, till the final conquest of that city by the Turks.

In France money must have been as scarce during the period as in England or nearly so. We find the king of that country, Charles the Bold, at the latter end of the ninth century, when projecting a military expedition into Italy, could raise, by all methods, some of them very violent, no larger a sum than ten thousand

[1] Henry, vol. iv. p. 281.

marcs, or about the weight of seventy-two thousand ounces of silver, little more than equivalent in money of this day to £18,000[1].

It appears by ancient documents in Alsace and in Saxony, if the price of corn be taken as the criterion of the scarcity of money, that the same deficiency was felt in those countries. In Alsace, at the end of the tenth century, the common money for current purposes was the pfennig. It was of copper, and sixty of them weighed exactly one marc or half a pound avoirdupois, or 120 of them were a pound weight. The price of a sheffel or bushel of wheat, weighing sixty pounds, or the same nearly as our English bushel, was seven of these pfennigs. Copper, probably, bore a higher value in proportion to silver than it does in the present day; or the bushel of wheat was sold for less than a penny farthing[2]. About two hundred and fifty years later, in the same country, the same measure of wheat was sold at twenty-four pfennigs, or about threepence farthing[3]. It appears by the accounts preserved in the cathedral of Strasburg, that the wages paid to the masons employed in the erection of that edifice was from one and a half to two of these pfennigs. At the

[1] Boulainvilliers, p. 114.

[2] Florencourt uber die Bergwerke der Alten, p. 57.

[3] Annales Colmarienses, 1289, fol. 24.

building of the great bridge at Dresden, in the thirteenth century, the labourers were paid two pfennigs daily; and, according to some fragments of mining accounts of Tillot and Chateau Lambert, the operative miners received no more than two pfennigs[1].

There are two records which have been preserved to the present time, which show the high value of money in France. The first is the ordonnance promulgated by Charlemagne at Frankfort, in the year 794. In the two preceding years the harvests had been deficient, a scarcity was experienced, and prices had risen. The ordonnance was issued to protect the consumers against those who always in seasons of scarcity have been the objects of abuse—the traders in corn, stigmatised by the name of monopolists. The price at which bread was to be sold was thus the maximum in a period of scarcity approaching to famine. The law was made in a general assembly, as it commences thus[2]: "*Statuit piissimus Dominus noster consentiente sanctâ sinodo, ut nullus homo, sive ecclesiasticus, sive laicus, nunquam carius vendat annonam, sive tempore abundantiæ, sive caritates, quam modium publicum et novitur statutum*, &c. &c." The price fixed was for twenty-four pounds of

[1] Florencourt, p. 58.

[2] Recueil des Historiens, tome cinquième, p. 651.

wheaten bread one denier, for thirty pounds of rye bread, or forty pounds of barley bread, also a denier. The livre of Charlemagne was a pound of silver of twelve ounces. It was divided into twenty sols, and those into twelve deniers. The denier was thus equal to threepence of our present money. The pound of commerce then contained twenty-four of our ounces, and we thus arrive at the conclusion, that the maximum price for thirty-six pounds of wheaten bread was threepence of our money, or twelve pounds for a penny, or that the legal four pound loaf of this country was then limited to be sold at a price not exceeding a farthing and one-third of that coin. The scarcity of grain may be inferred from one part of the ordonnance in question, by which it appears, that the corn belonging to Charlemagne himself, which was the produce of the royal domains that he cultivated, was to be sold at a price one-third below the enacted maximum. It was probably delivered to the persons immediately about the court, and considered as a gratuity to relieve them in a season of general suffering[1].

At a subsequent period, another ordonnance of a king of France is to be found issued at the same place as that of Charlemagne, but after a

[1] Lamare, Traité de Police, tome ii. p. 337; and M. de la Bruere, Vie de Charlemagne, tome ii. p. 33.

famine and pestilence, "qui avoit fait mourir une infinité de personnes."

This ordonnance of king John of France, issued in 1350, fixes the rate at which thrashers in the barn are to be paid for their labour. Those who thrashed by the day were to receive not less than eighteen deniers[1]. The livre, which in the time of Charlemagne was a pound of silver of twelve English ounces, worth sixty shillings, had been diminished gradually either in weight or in purity, and was worth only ten francs of the present French money in the reign of John[2].

The livre was still divided into twenty sols, and they again into twelve deniers. It was therefore of the value of one hundred pence of our present money, and the sol was worth five-pence; and eighteen deniers were equal to a sol and half, or sevenpence halfpenny.

If the thrasher worked by the great, he was to receive twelve sols or sixty pence for each muid of wheat, and eight sols or forty pence for each muid of barley or oats. The muid was a measure containing twelve setiers, and each setier was a fraction more than four bushels and a half:

[1] Recherches sur la Valeur des Monnoies, et sur le Prix des Grains avant et après le Concile de Francfort. Edit. Paris, 1762.

[2] M. Abot de Bazinghen, Traité des Monnoies, vol. i. p. 642. Edition Paris, 1764.

thus it appears, that for thrashing fifty-four bushels he would receive five shillings, or nearly one penny and a farthing each bushel.

If the thrasher was paid in kind, he was to receive every twentieth bushel of what he thrashed. We thence infer, that the average work of a man was to thrash about six of our bushels in a day. We thus see, that the rate of wages for thrashing was to the price of the wheat as six to twenty, and the former being sevenpence halfpenny, the latter would be two shillings and a penny.

At that time, it is affirmed that the rate of wages had been increased one-third on account of the scarcity of workmen which the preceding mortality had occasioned.

There are many notices of prices of grain in France in the intermediate periods between the two decrees of Frankfort, as well as subsequent to the last of them, but their authenticity may be doubted; and besides, the measures were so different in the different provinces, that, added to the changeable value of the money, no dependence is to be placed on any calculations that can now be made. These two ordonnances, to which reference has been here made, will sufficiently show that the high value of metallic money which has been noticed in Germany, and will be enlarged upon in Great Britain, was felt in

the same degrees in France in the prices of the necessaries of life.

From the Conquest till the time when, after the discovery of America, the precious metals from the new world began to display their effects on the prices of commodities in Europe, we are led to draw our proofs and illustrations chiefly from English history, because the requisite documents are more abundant and more accessible, and because the monetary system was more simple, and is now more easily to be made intelligible.

At the time of the Conquest, the Norman money superseded the Saxon. The Norman pound was a troy pound weight of twelve ounces of silver divided into twenty parts called shillings, and these again divided into twelve parts called either pennies or pennyweights. Thus, the money of that period, taking the silver at 5s. per ounce, may be valued at three times the same denomination in the present day. Though there was at intervals some alteration and some adulteration[1] of the coin, yet large payments

[1] The crime of clipping and counterfeiting the current coin seems to have been carried on to a great extent, though some severe laws were enacted and put in force to punish the offence. Whether guilty or not, the Jews were the principal sufferers for this breach of the laws, as two hundred and eighty of them were put to death in London alone in the year 1279,

being made by weight, operated as a check on those deviations, and money continued at the same value to the reign of Edward III., who, in the year 1346, coined a pound of silver into twenty-two shillings and sixpence, and thus reduced the nominal pounds from three pounds of our present money, to two pounds twelve shillings and eightpence. The value of money continued at that rate till the year 1412, thirteenth year of Henry IV., when by the act of parliament of that date the pound of silver was ordered to be coined into thirty shillings, and thus the value of money became double that of our present currency. In the year 1464, Edward IV. caused the pound weight of silver to be coined into thirty-six shillings and sixpence, and thereby reduced the value of the nominal pound to about thirty-one of our present shillings.

Henry VIII. in the first year of his reign, 1484, coined the pound of silver into forty-five shillings, but in the thirty-fourth year reduced the value of the shilling still more by coining forty-eight from the pound. It continued at

besides many others in several parts of England. At the same time, all the goldsmiths in the kingdom were seized and thrown into prison on suspicion of being guilty of the same crime. See Henry, vol. viii. p. 348; Anderson, vol. i. p. 129; Walsingham, Hist. Angl. p. 48; Hemingford, Hist. Ed. I., p. 6.

that rate till the third of Edward VI. in the year 1550, when the pound was coined into seventy-two shillings; but in the sixth year of that prince the value of the shilling was increased, sixty being coined from the pound. This rate was continued through the reign of Mary to the forty-third of Elizabeth, when sixty-two shillings, as has been continued to the present time, with the recent exception, were made from a pound, and the fineness of the silver was improved.

In order to simplify to the reader the view intended to be presented, the money mentioned, in the several ancient writers hereafter quoted, will be reduced into money of the present day, on the assumption, that the statement of the alteration here given is sufficiently correct for the purposes of this inquiry, though there may be some exceptions, owing to short variations in the course of so many centuries. Some deviations were made on the introduction of gold coin about the year 1395, on account of the relative value of that metal to silver being fixed by the king too high, which made the public reluctant to receive it. Henry the sixth, in the first year of his reign, 1422, coined the pound of silver into thirty-seven shillings and sixpence, but in the fourth year brought it to thirty shillings, and in the last year again reduced it to thirty-seven and sixpence. There are other smaller instances of deviation. If all of these

had been noticed, they would have complicated a subject which it is the design of this inquiry to simplify and make intelligible. From the Conquest to the year 1346, all monies are here reduced into our present currency at the rate of sixty shillings to the pound; from 1346 to 1412, at the rate of fifty-two and eightpence to the pound; from 1412 to 1464, at the rate of forty shillings to the pound; from 1484, at the rate of forty-five shillings to the pound; from thence to 1550, at the rate of forty-eight to the pound; during the next two years, at the rate of seventy-two to the pound. In the year 1551, the shilling was the sixtieth part of a pound, but contained more alloy till the forty-third of Elizabeth, 1601, when the silver being made of greater fineness, the pound was made into sixty-two shillings. From the year 1551, the shillings will be considered of the same value as that coin in our domestic transactions of the present day, that is, as the twentieth part of a pound.

Amidst numerous facts, tending to show the high value of gold and silver when compared with all other commodities, it is difficult, where all are striking, to select those that shall most clearly indicate their real worth or power of purchase.

Athelstan, about the year 937, subdued Ludwal, the chief prince of Wales, and made a peace on condition of a tribute being paid, consisting

of twenty pounds weight of gold and three hundred pounds weight of silver, twenty-five thousand oxen, besides hounds and hawks. With this treasure, whose value amounted in our present money to no more than about seventeen hundred pounds, Athelstan was rendered so rich, that he was enabled to form family alliances with Otho the great, emperor of Germany, with the mayor of the palace in Paris, and with Louis prince of Aquitain. This was, however, a few years earlier than the discovery of the mines of Goslar in Hanover, by which, as has been before noticed, the emperor Otho had been suddenly enriched and elevated[1].

In the year 1192, Richard I. king of England was detained by the Duke of Austria in passing through his dominion, on his return from the Holy Land, and delivered up to the emperor, Henry of Germany. In Rymer's Fœdera, (page 30) is preserved a letter from that monarch to his mother, Queen Eleanor, and to the judges of England, in which he urges them "to raise the money required for his ransom by that sordid emperor, being 70,000 marcs;" and for the attainment of this object, he desires that "all the money of the churches may be borrowed as well as that of the barons." There is no mention made of any application to the citizens or merchants, who were, probably, too poor

[1] Anderson, vol. i. p. 92.

to offer a prospect of obtaining any contributions from them. This sum in our present money would amount to £140,000. Other accounts make the ransom amount to £200,000, and one to £280,000; but the authority of Rymer is undoubtedly to be preferred to that of any other.

Arnoldus, abbot of Lubec, in his continuation of the *Chronicon Sclavicum* of Helmoldus, (lib. iii.) says, "that when in January, 1194, King Richard of England was discharged from his imprisonment, his ransom was raised with great difficulty throughout all his dominions; so that even the gold and silver cups and other vessels used in the holy Eucharist were melted for the purpose; and that over and above that a tax was laid upon all persons, both ecclesiastical and civil, of a fourth part of their income for one year. Twenty shillings were required on every knight's fee; one year's clip of wool was borrowed of the cistercians; and the clergy of the king's dominions in France contributed very largely to effect the monarch's deliverance."

In 1248, during the contentions for the possession of the holy land, Lewis, King of France, was made prisoner in Egypt by the Saracens, and his ransom was effected at the price of little more than fifty thousand pounds of our present money.

Near one hundred and twenty years later,

John, King of France, was brought prisoner to England. The circumstances of his capture, and the state of his kingdom, with the claims the English monarch set up to the whole of his dominions, were thought to justify the demands for an enormous ransom. At length the amount of the ransom was fixed at three million crowns of gold of three shillings value each, being, according to our estimation, about one million two hundred and fifty thousand pounds of our present money. The first payment was to be one fifth of that sum, and the remainder in subsequent instalments. "This first payment," says Voltaire, in his General History, "was found so great, and France was so exhausted, that it was not possible to furnish it; so they were obliged to recall the Jews and to sell to them the privilege of living and trading in France[1], and the successor of John was himself reduced

[1] John died in the Savoy in 1364. From his first arrival in England that monarch had employed secret agents in London and in other places, who privately collected the picked gold money of the realm, consisting of the nobles of the first and second coinage. These he had formed into plates, and packed in barrels to be carried to France. On his death-bed he sent to King Edward, confessed to him what he had done, and requested his forgiveness, which was granted; but Edward ordered what had been thus collected to be seized, and punished with severity the Lombards who had been accomplices in the transaction. See Knighton, column 2627, who having died, according to Holingshead, in 1386, must have been alive and well acquainted with the facts.

to the necessity of paying for the necessaries for his household in money made of leather, in the middle of which there was driven a silver nail." There was great delay in the payment of the succeeding instalments, and one fifth of the amount was still owing, when another war broke out under Henry the Fifth, near forty years afterwards [1].

The public entertainments, and the expenses of them, will serve to show the high value of money, or the low cost of all the necessaries and luxuries, as they were doubtless then deemed, of the table and the household. The account of the preparation for the dinner at the coronation of Richard the First in 1189, to which all who held lands as vassals of the crown were invited, is as follows. A robe for William, son of the Duke of Saxony (who was an accidental visiter in England), one pound seventeen shillings; for 870 hens, 200 cups, 1350 scutellis or platters, twelve pounds fifteen shillings; for 2000 plates and 200 cups, three pounds fifteen shillings and nine-pence; for 2000 hens to be bought and kept at Westminster for the coronation, and 200 more cups, twenty-four pounds nine shillings and three-pence; for 1200 plates and 500 cups, six pounds three shillings and

[1] Fœdera, vol. vi. p. 178.

nine-pence; for 900 hens, eleven pounds five shillings; for 1900 hens, and for bringing them to London, twenty-five pounds ten shillings; and for 100 plates and 300 cups, three pounds eighteen shillings[1]. It does not appear for how many persons these preparations were made, nor can these be supposed to be the only articles provided, though there being no less than 4800 hens prepared, we must suppose the company amounted to some thousand persons.

There is in the Chronicon Preciosum of Fleetwood an account of the expenses of the installation feast of the Prior of St. Austin in Canterbury, in the year 1309. That year was one of peculiar scarcity, and almost every description of provisions was higher by very far than in the previous or subsequent years of the same period. The cost of the various articles was as follows: Wheat, 21*s.* 6*d.* per quarter; malt, 18*s.* per quarter; oats, 12*s.* per quarter; wine, 4*l.* per pipe; oxen, 54*s.* each; hogs, 9*s.* 6*d.* each; sheep, 9*s.* each; geese, $11\frac{1}{4}d.$ each; pullet, $10\frac{1}{2}d.$; and rabbits 6*d.* each. The number of guests was six thousand, and the whole cost of the entertainment, including music, cooks and attendants, and also 3300 dishes and 1400 wooden cans or jugs, amounted to eight hundred and

[1] Madox Hist. Exchequer, c. 10. p. 253.

sixty-two pounds. If this entertainment had occurred in 1299, ten years before, or in 1336, twenty-five years later, the cost would not have amounted to one-third of the sum which was expended in this year of great scarcity.

The cattle varied in price like every other production of the soil, very far beyond any fluctuations that have been experienced in modern times; but even when dearest they were at prices so low as to indicate very clearly the high value of the precious metals. Bishop Fleetwood, in the Chronicon Preciosum, says that in the year 1000 an ox was sold for 7*s.* 6*d.*, a cow at 6*s.*, a sheep at 3*s.*, and a pig at 2*s.* In the year 1145, the same author gives sixty shillings as the price of forty sheep, or 1*s.* 6*d.* a head, and oxen he reports at 9*s.* each.

Madox, in his Baronia Anglica (cap. xiv.), relates that the live stock of a farm was sold in 1184, as follows: 33 cows and 2 bulls for 25*l.* 1*s.*; 500 sheep at 67*l.* 10*s.*; 66 oxen for 54*l.* 9*s.*; 15 brood mares, 7*l.* 17*s.* 6*d.*; 22 pigs for 3*l.* 6*s.*; and 11 heifers for 8*l.* 2*s.*; being at the rate of 14*s.* $3\frac{3}{4}$*d.* for the cows; 2*s.* $8\frac{1}{4}$*d.* for the sheep; 16*s.* 6*d.* for the oxen; 10*s.* for the mares; 14*s.* $8\frac{1}{2}$*d.* for the heifers; and 3*s.* for the pigs.—Bishop Pearson, in this year, says that four hens were valued at 6*d.*, and a ram at 2*s.*

Madox, in his History of the Exchequer, re-

lates that Hugh de Bosca, sheriff of Hampshire, in 1199, stocked the king's lands of Mienes with twelve oxen at 9*s.* each, and one hundred sheep at 1*s.* each.

In the year 1299, we find in the Chronicon the prices of several articles as fixed by the Common Council of the city of London, and as they are for the most part that kind of food which must be considered as luxurious, it is not surprising, considering the state of society, in which the middle classes were few, and the higher classes were supplied with them from their own domains, and the consequently contracted market for them, that they should appear high when compared with the prices of sheep and oxen. The tarif is as follows, viz.—a cock, 9*d.*; a goose, 1*s.*; a capon, 7½*d.*; 2 pullets, 9*d.*; plover, 3*d.*; a swan, 9*s.*; a crane, 3*s.*; 2 woodcocks, 4½*d.*; a fat lamb from Christmas to Shrovetide, 4*s.*, afterwards 1*s.*; wheat, 5*s.* per quarter, and in some parts of the country 4*s.* per quarter.

In the year 1315, the act of the 8th Edward Second was passed on account of the intolerably high price of provisions, by which it was enacted that those who would not sell their commodities at the following rates should forfeit them to the king, viz., a best ox not fed with corn at 48*s.*, if fed with corn, 72*s.*; a best fat cow at 36*s.*; a

fat hog of two years old, 10*s.*; a fat wether sheep unshorn at 5*s.*, if shorn, at 3*s.* 6*d.*; a fat goose for 7½*d.*; a capon, 6*d.*; 24 eggs at 3*d.*[1]

In the year 1336, every article of food fell to a very low price, a circumstance attributed by Knighton and by Fabian, two contemporary writers, to the king, Edward III., having collected together all the coin of the kingdom to carry on his hostile operations against France and Scotland. He seized on all the money belonging to the Lombards in England, and on all the property of the alien priories. He also borrowed, though not till the following years, all the gold and silver plate, even gold cups set with jewels, giving his written acknowledgment to pay for the same as therein valued. These valuations are a proof that a pound in money was a pound weight of twelve ounces of silver, no gold being then coined; for in the valuations, very little allowance is made for the fashion unless for the precious stones that were set in the plate. Some of these pieces being old and battered, are said to be "*ponderis et pretii sex librarum*" of the weight and value of six pounds[2].

The low prices of 1336, according to the Chronicon, were for wheat 6*s.* per quarter; an

[1] Rymer's Fœdera, vol. iv. p. 510.
[2] Fœdera, vol. v. p. 39.

ox, 20*s.*; a fat sheep, 2*s.*; a fat goose, 6*d.*; a young pig, 3*d.*; and six pigeons, 3*d.*

The wages of labour, or the rates allowed for the subsistence of different classes of persons, may both be usefully employed to elucidate the value of the precious metals.

We find in the Chronicon Preciosum, that in the year 1237 there were three chaplains who did daily duty in the church of the Templars, each of whom were paid a yearly salary of four marcs, each marc being eight ounces of silver, thus making their pay equal to £8 of our currency.

By an act of 36th of Edward III. cap. 8., in the year 1414, it is ordered that no man shall give to a parish priest more than ten pounds a year, or else his board and four pounds a year. In 1414, by the act of 5th Henry V. cap. 8., it is enacted that the yearly salary of chaplains shall be nine pounds six shillings and eightpence, and that of parish priests twelve pounds. In 1421, the archbishop of Canterbury, in convocation, confirmed a former order, by which each parish priest was to content himself with eight marcs a year, or with four marcs and his diet.

Fleetwood, speaking of the year 1439, observes, that a clergyman could maintain himself respectably for ten pounds a year.

We find in the Chronicon, that workmen took their wages in wheat at the price of sixteen-

pence the bushel in the year 1351; at which time weeders and haymakers were paid at the rate of $2\frac{1}{2}d.$ per day; reapers of corn from $4d.$ to $6d.$ per day; masons and tilers $6\frac{1}{2}d.$ and other labourers $1\frac{1}{4}d.$ per day. The wages to servants employed in husbandry was fixed by the 12th of Richard II. cap. 2., at the following rates. Bailiff, $31s.$ and clothing once a year; a first hind, $21s.$ $3d.$; carter and shepherd, $21s.$ $3d.$; cowherd and swineherd, $14s.$ $4d.$; a woman, $12s.$ $8d.$ yearly. It is presumed these wages were besides their food and lodging, though that does not appear by the act.

By Madox's Formulare Anglicanum, it appears that, in 1425, cows were commonly valued at $16s.$ per head.

According to the Chronicon, in 1445, wheat was $6s.$ $6d.$ per quarter; ale at $1d.$ a gallon; a young swan, $6d.$; a goose $6d.$

The expense of maintenance was proportionably low. In the second volume of the Fœdera, p. 1016, we find the sum allowed daily, for the maintenance of the bishop of St. Andrews, who in the year 1305 was imprisoned in the Tower for his adherence to his king, Robert Bruce, viz.:

	d.
For the bishop's table	6
One man servant	3
One boy, ditto	1½
Chaplain to say mass	1½
	1 0

being equal to three shillings in the present day.

In the year 1470, Edward the Fourth held King Henry the Sixth as a prisoner in the Tower. He was attended by ten persons, and the allowance for the subsistence of the whole was at the rate of 3*l.* 10*s.* per week.—Fœdera, vol. ii. p. 712.

According to the Formulare Anglicanum of Madox (p. 110), the Lady Anne, daughter of King Edward the Third, who was married to Lord Howard, son of the Earl of Surry, was allowed, in 1496, 1*l.* 11*s.* weekly, "for her exhibition, sustenation, and convenient diet of meat and drink; also for one gentlewoman, one woman, one girl, one gentleman, one yeoman, and three grooms, in all eight persons, 80*l.* 12*s.* per year; which included their clothing and wages; besides 25*l.* 10*s.* 4*d.* for the maintenance of seven horses."

It is thus seen, that as late as the end of the fifteenth century, about the time of the discovery of the mines of America, but before any considerable part of their products had circulated in

Europe, a family of such distinction as to need seven horses could be supported at little more than one hundred pounds of our money for a year.

When the order of the Knights Templars was abolished in England in 1310, and their vast wealth seized by the crown, the allowance made to the members of that community appears to have been very disproportionate to the rank they had held, and the profusion in which they had lived. The grand master was assigned a pension of six shillings a day, and each of the knights one shilling, of our money.

Although wine was a commodity of foreign growth, yet its consumption must have been large among the more opulent classes of the community, and the price of it at various periods must be an indication of the value of money.

According to the Chronicon, the price of the Rochelle wine in the reign of King John, in the year 1216, was 3*l.* per ton, the ton being then, as now, nearly two pipes. Anjou wine was 3*l.* 12*s.* and the best French wine 4*l.* per ton. In Rymer's Fœdera (vol. i. p. 36) we find, in 1236, the retail price of wine to be sixpence per gallon. In 1313 in Stow's Survey is an account from the cofferer or treasurer of the Earl of Leicester, who seems to have been the most expensive person of his age: his annual consumption of wine is stated to be three

hundred and seventy-one pipes, which cost 2*l.* 10*s.* 10½*d.* per pipe. It seems probable, from some casual remarks, that this wine was drawn from the estates belonging to the earl in Anjou, where, like some others of the English nobility, he had extensive possessions. In 1340, the current value of French wine, according to the Fœdera, was 4*l.* 10*s.* the pipe.

By an act of Richard II. in 1381, wines were to be sold by retail at the following prices, viz. Gascon, Spanish, and Rhenish wine at 1*s.* 3*d.* per gallon, and Rochelle wine at 10*d.* the gallon.

According to Stow's Survey, the price of Gascon wine in 1499 was 2*l.* 11*s.* 6*d.* per pipe.

The price of wine seems to have fluctuated much, according to the relative productiveness of the respective seasons, similar to what is seen in this country in the price of cider in those counties where it forms the common drink of the most numerous class of the inhabitants. It may not be the most certain test to apply to the value of money, but it seemed improper to omit the few notices of its price which are scattered through the early records of this kingdom.

Rymer, in the Fœdera, gives an account of a transaction which throws light incidentally on the prices of several commodities at nearly the latest time of the period we are viewing, a few years before the discovery of America.

In 1470, seven Spanish ships, loaded with iron,

wine, fruits, and wool, on their voyage to Flanders, had been captured by some English vessels, and brought into our ports. The owners applied to the king, Henry VI., for redress, and exhibited on oath an account of the burden and value of the ships, and the prices at which the merchandise would have sold had they reached the place of their destination. The value of the ships, including their stores and provisions, is stated as follow, viz.:

		Money of that time.	Money of this time.
1 ship of	100 tons	£107 10	£273 15
1	70	70 0	178 10
1	120	110 0	280 10
1	40	70 0	178 10
1	110	140 0	357 0
1	110	150 0	382 10
1	120	180 0	459 0

The owners of these cargoes also declared upon oath, that if the vessels had arrived in Flanders, the merchandise with which they were freighted would have sold at the following prices, viz. the Gascon or Bordeaux wine at 6*l.* the pipe; the Bastard wines 5*l.* the pipe, the iron 11*l.* the ton, and the wool 5*l.* per sack, each sack being one quintal and three quarters; thus little more than $7\frac{1}{2}d.$ per pound for the Spanish wool, which at that period was celebrated for its superior fineness.

In this recapitulation of prices, that of corn

has not been overlooked, though it has been but slightly noticed. We have good reason to know that the system of agriculture was bad, as it always necessarily must be in the early progress of civilization. With bad agriculture, the variation in the productiveness of different years will be greater than in an improved state of culture. The prices of corn, consequently, in that step of low advancement, will be chiefly influenced by the fertility or non-fertility of a particular year or of a series of years. These prices are therefore a less sure test by which to try the value of the precious metals than the commodities, like wool, iron, coal, and some others, which do not depend on the changes of the atmosphere in a climate, like that of Europe, subject to great vicissitudes.

There is another reason why the price of corn is an uncertain criterion. In ancient times in England, wheat could not be considered as the chief food of the inhabitants: very little of it was used by the agricultural population, which then composed nine-tenths of the inhabitants; and among the people in the towns it was by no means the universal or the principal food. Rye and barley were the chief articles in consumption; but among a people who were chiefly fed by corn of their own growth, the quantity brought to the markets in the towns would perhaps be much less of those kinds of grain than of wheat.

Hence, though registers of the prices of wheat are to be found in ancient records, those of rye and barley are but rarely noticed. The circumstance of that kind of corn being least noticed which was the most used gives a degree of uncertainty to all calculations founded on the prices of corn alone.

There is also reason to believe that when the population of this country was very much less dense than it is at present, there were much more numerous herds of black cattle, perhaps of sheep, but certainly of swine, in proportion to the number of inhabitants, than there have been in succeeding ages. The value of meat as compared with that of grain must then have been lower, and probably contributed, especially in those seasons, which frequently returned formerly, when a scarcity of corn occurred, more to the subsistence of the lower classes than the several descriptions of the cereales.

It may be inferred that cattle of both kinds were more abundant than at present, because almost the only articles that were exported were the skins and the wool, and these were more than sufficient to pay for five times as much wine and all other commodities as our ancestors drew from foreign countries; and all the writers of the time agree that the balance was discharged in the precious metals, by which England was enabled to pay the heavy exactions of the papal

throne. On this subject, Matthew Paris, speaking of the year 1240, says, "Such was the rapacity of the Popes, and such the stupid bigotry and ignorance of the laity, that it was the subject of general complaint that there did not remain in all England so much treasure as had been extorted from it in three years by the see of Rome." Henry the Third in 1244, on inquiry, ascertained that for several years the annual amount sent to the Popes had been sixty thousand marcs, or one hundred and twenty thousand pounds of our present money.

By comparing the price of wool, as given in the reign of Edward the Third, with Exchequer records of the year 1354, we find that the quantity of wool exported amounted to full 12,715,200 pounds weight. The sheep of that age were smaller in size than those of the present day, and the wool thus exported could not be the produce of less than three or four million sheep. Besides the wool, there was in the same year coarse cloths exported whose value amounted to 16,266*l.* in the money of that time, or to 41,490*l.* in our present money.

In a country where no other clothing was used by the great mass of the inhabitants but that made from the wool of their flocks, where after supplying that demand there could be such a surplus as is here exhibited, the carcasses of the animals must in deficient harvests have supplied

that vacuum which was created by the scarcity of corn. The flocks of sheep were kept in England then as they are now in Spain, in Saxony, and in Poland—for the sake of the profit gained by the wool, and not for the sake of the meat, which, unless in years following an unproductive harvest, was of very little value.

After these observations on the uncertainty of the price of wheat as a standard by which to measure the value of the precious metals, we may be permitted to lay before our readers the best account we have been enabled to collect of those prices at different periods.

The great fluctuations in the value of corn in former ages have been already noticed. They arose out of the want of capital by which a part of the surplus produce of the most productive years might be retained to meet the exigencies of following years of scarcity. The requisite capital was not then created, and the land with its annual fruits was almost the only kind of wealth in existence. The surplus of the productive years could find no purchasers who could store it, and the price fell so as scarcely to repay even the labour which had been expended on the crops. On the other hand, when a year of scarcity occurred, as there was no previously stored stock, the few who had money became competitors with each other, and the prices rose to a height above those of medium years

of which we have had no instances in modern times.

The instances of the variation in prices which are recorded in former times will excite surprise in those readers who have not paid attention to the subject, and ought to make us all grateful to that Providence which has brought us into life in a period much less exposed to suffering than that in which our forefathers lived.

As it may be desirable to produce at one view the scattered notices respecting the prices of wheat which are to be found in the various ancient authors, we here exhibit such as have been collected, which, though the list is very imperfect, will tend in some measure to show that the variations in price depended much more on the fertility or barrenness of the seasons, and on the favourable or unfavourable state of the weather at the respective harvests, than on any great alteration in the value of the gold or silver for which they were exchanged.

Year.	Price per quarter in money of that time.			Price per quarter in money of the present time.		
	£.	s.	d.	£.	s.	d.
a 1120	0	2	0	0	6	0
a 1197	0	18	8	2	16	0
a 1213 lowest price	0	1	6	0	4	6
1216 highest price	0	6	0	0	18	0
a 1223	0	12	0	1	16	0
a 1237	0	3	4	0	10	0

Year.	Price per quarter in money of that time. £. s. d.	Price per quarter in money of the present time. £. s. d.
a 1243	0 6 0	0 18 0
b 1244	0 6 0	0 18 0
b 1246	0 16 0	2 8 0
a 1247	0 13 4	2 0 0
a 1257	1 4 0	3 12 0
g 1258 a great famine, when many people were starved	2 0 0	6 0 0
a 1270 a famine, when, according to Pecham as quoted by Fleetwood, "provisions were so scarce that parents did eat their own children," wheat sold at	4 16 0	14 8 0
and sometimes at	6 8 0	19 4 0
a 1286 early part of this year	0 2 8	0 8 0
A storm which fell on St. Margaret's night brought the price after that to	0 16 0	2 8 0
a 1287	0 3 4	0 10 0
a 1288	0 1 6	0 4 6
g 1288	0 3 4	0 10 0
a 1289 was, according to Stow, the hottest summer ever known. Wheat in London	0 2 0	0 6 0
—— in some parts	0 1 8	0 5 0
a 1289 Wheat in some parts	0 1 4	0 4 0
—— in other parts	0 1 0	0 3 0
—— in the north-west	0 0 8	0 2 0
a 1290	0 16 0	2 8 0
a 1294	0 16 0	2 8 0
a 1295	0 2 6	0 7 6

Year.	Price per quarter in money of that time. £.	s.	d.	Price per quarter in money of the present time. £.	s.	d.
a 1299 . .	0	1	8	0	5	0
a 1302 . .	0	4	0	0	12	0
a 1309 . .	0	7	2	1	1	6
d 1309 average of the months and of the different qualities of wheat at Oxford	0	7	6	1	2	6
d 1310 . ditto	0	8	0	1	4	0
d 1311 . ditto	0	6	0	0	18	0
d 1312 . ditto	0	4	5½	0	13	4½
d 1313 . ditto	0	4	9½	0	14	4½
d 1314 . ditto	0	5	1	0	15	3
d 1315 . ditto	0	7	3	1	1	9
a 1315 after harvest	1	0	0	3	0	0
a 1316 after harvest	2	0	0	6	0	0
a 1317 before harvest	2	4	0	6	12	0
a 1317 after harvest	0	14	0	2	2	0
d 1324 Oxford averages	0	6	0	0	18	0
d 1325 . ditto	0	5	5	0	16	3
d 1326 . ditto	0	4	9	0	14	3
d 1327 . ditto	0	3	10	0	11	6
d 1328 . ditto	0	3	0	0	9	0
e 1329 . .	0	9	0	1	7	0
a 1349 . .	0	2	0	0	5	3
f 1351 . .	0	6	8	0	17	4
a 1359 . .	1	6	8	3	7	4
a 1361 . .	0	2	0	0	5	3
a 1369 . .	1	0	0	2	12	8
a 1379 . .	0	4	0	0	10	6
a 1387 at Leicester	0	2	0	0	5	3
a 1390 . ditto	0	16	8	2	3	9
a 1401 . .	0	16	0	2	2	0
a 1407 . .	0	3	4	0	9	6
a 1407 seed wheat	0	4	4	0	11	1
a 1416 . .	0	16	0	1	12	0
a 1423	0	8	0	0	16	0

Year.	Price per quarter in money of that time. £.	s.	d.	Price per quarter in money of the present time. £.	s.	d.
a 1434	1	6	8	2	13	4
a 1434 after harvest	0	5	4	0	10	8
c 1436	0	6	8	0	13	4
a 1439	1	6	8	1	13	4
a 1440	1	4	0	2	8	0
a 1444	0	4	4	0	8	8
a 1445	0	4	6	0	9	0
a 1447	0	8	0	0	16	0
a 1449	0	5	0	0	10	0
a 1451	0	8	0	0	16	0
a 1453	0	5	4	0	10	8
a 1459	0	5	0	0	10	0
a 1463 in London	0	2	0	0	4	0
a 1463 in Norfolk	0	1	8	0	3	4
a 1464	0	6	8	0	10	4
a 1486	1	4	8	1	12	10
a 1491	0	14	8	0	19	1
a 1494	0	4	0	0	5	4
a 1496	0	4	0	0	5	4
a 1497	1	0	0	1	6	8
g 1499	0	4	6	0	6	0
g 1504	0	5	8	0	7	7
a 1521	1	0	0	1	6	8
a 1551	0	8	0	0	10	0
a 1553 to 1556	0	8	0	0	8	0
a 1557 before harvest	2	13	4	2	13	4
1557 after harvest	0	5	0	0	5	0

[1] The prices marked (a) are extracted from the Chronicon Preciosum of Fleetwood; those marked (b) from Matthew Paris; those marked (c) from the Rolls of Parliament; those marked (d) from a valuable work entitled "Prices of Corn in Oxford," recently published, by the Rev. W. F. Lloyd, stu-

If the years in which famine or a scarcity approaching to famine be taken from the foregoing catalogue of prices, it will be found that no great difference is observable between the early and late years of the period which intervenes between the time of the Norman conquest and that of the discovery of America. An inference from hence may perhaps be fairly drawn that no very great increase or decrease in the stock of the prècious metals occurred during those centuries; or it may be presumed that the supply from the mines was nearly equal to the consumption by friction on the circulation, and to that portion which either had been lost from being buried in the ground and not again found, or that had been lost by shipwrecks.

dent of Christchurch; those marked (e) from Cotton's Records; those marked (f) from Rymer's Fœdera; and those marked (g) from Stow's Survey.

CHAPTER XIII.

On the interchange of the precious metals between the eastern and western parts of the civilized world in the period between the dissolution of the western Roman empire and the discovery of America.

It would lead far from the immediate purpose of this inquiry to enter into the consideration of that extensive subject, the commerce between Asia and Europe in the period in question. It would lead still farther to take a view of the political events of the period. They both had, however, a considerable influence on the locality of the metallic money, as they removed it from one part of the world to another, though they did not produce any great effect on the increase or decrease of the whole quantity. The crusades, which occupied a long and stirring space, and which carried the population and wealth of the western world to the boundaries of Asia, must have made the precious metals more abundant in the Greek empire, contracted as it then was, and in the territories under the dominion of the Mahometans; but the commerce carried on by the Venetians, the Genoese, and the Pisans must have brought some portion of it back again to

western Europe, in exchange for the wool, wine, iron, linen, and other commodities which the industry of those divisions of Europe furnished.

Although this commerce between Europe and Asia was of trifling extent as compared with what has existed since the discovery of the route to India by the Cape of Good Hope, yet as its influence on the civilization of Europe was powerful at an early period, it would be improper not to take a slight review of its history and progress. Constantinople, from its first establishment as the capital of the Roman empire, had gradually become the depôt for the valuable productions of Asia. Spices, incense, perfumes, garments of silk, and diamonds and other precious stones, were stored there and distributed from thence to the other parts of Europe. Some parts were conveyed by land through the valley of the Danube, but the greater portion passed through the hands of the Venetians, a people that arose out of the ruins of the kingdom of Lombardy.

The turbulent state of the Italian continent rendered all property insecure at first, and this led to the occupation of some islands in the Adriatic, where commerce might be conducted with less danger of interruption from the prevailing commotions. When the Arabian power arose in Asia, the intercourse between Venice

and Constantinople was increased by the aid which the former could give to the latter in securing them by their naval armaments against the Mahometan pirates, who had at that early period commenced their maritime expeditions against the shores of Asia, Africa, and Europe. The Venetians claimed and obtained special privileges in Constantinople. They were indulged with freedom from taxation on the goods they imported in their own ships; a part of the city was appropriated to their exclusive residence; and a court of law was established, to which alone they were amenable in all cases. From the commerce with the heretics of Constantinople, the first step was taken towards an intercourse with the infidels in their vicinity; and religious hatred being thus weakened or lost sight of in the gains of trade, the Venetians extended their commerce to the towns on the Black Sea, and to all the countries occupied by the followers of the Arabian prophet.

This trade at the commencement, as was the case in the more remote ages, was chiefly in human beings. The Venetians bought slaves, whether christians or infidels, and found ready purchasers among the Mahometans who had possessed themselves of Sicily and Spain. They proceeded farther and drew a great gain by supplying weapons of war to the unbelievers. This trade, though forbidden by an edict of the

Emperor Charlemagne, and by decrees of the Popes, was continued in a contraband way to a very profitable extent. The inhabitants of Amalfi shared the disgrace and the profit of this trade with the Venetians, and both were soon afterwards joined in it by the cities of Genoa and of Pisa. Before the commencement of the crusades, the ships of those states found a beneficial employment in conveying to Palestine the crowds of pilgrims which flocked from every part of Christendom to offer their devotions at the sacred shrine of Jerusalem. The Amalfians had obtained permission to establish a factory in the holy city, at that time in the power of a sultan of the race of the Fatemites, which served as a shelter for pilgrims, and as a storehouse for the commodities which Europe furnished to the Mahometans. Those Italian states were the channels by which the gold from India, from the eastern shores of Africa, and from the interior of that continent, flowed into Europe. The Byzantines drew some of it by their land trade with the east, some of it reached Asia Minor by the cities on the Persian gulf, and some was brought either by the Red Sea or by the caravans, which after crossing that sea near the straits of Babelmandel passed the whole length of Arabia on the eastern side of it.

A modern writer on this subject observes, that "the Lombards and the Franks, who ruled

over extensive countries, wanted not gold but industry and cultivation. They perceived the necessity of employing the Venetians, who brought to them from the east, drugs, salt, clothing, arms, gold, gold dust, silver, and a hundred other commodities, which they exchanged for grain, wine, iron, wood for shipbuilding and for oars, and other purposes; for wood abounded in Italy and on the Alps. These were eagerly demanded and abundantly supplied, in spite of the prohibitions of Agnello Partecipazio, Doge of Venice, in 822, and of the Greek emperor in 971. The latter particularly complained that the Venetians, not being satisfied with trading in the products of the neighbouring countries, and with being the carriers between the several Mahometan divisions of Egypt, Caramania, and Barbary, were supplying the infidels with ship timber and with arms[1]." The same author observes, p. 39, "The Venetians obtained the privilege in several Mahometan countries, as well in Africa and Caramania, as in the cities on the Black Sea, of possessing churches, keeping inns, and of being tried by their own judges. They were besides exempt from taxation on wine, and were even permitted to coin zechins out of the old Saracenic dirhemi."

[1] Memorie Storicha de' Veneti di Jacopo Filiasi. Padova, 1812, vol. vi. p. 23.

We are not, however, disposed to think that during the middle ages much more gold was brought into Europe from Asia and Africa than the amount of silver which was sent from Europe to those divisions of the globe. The proportionate value of gold to silver was less in Asia than in Europe. At all times a profit might be gained by exchanging one for the other: when gold in Asia and Africa was worth no more than eight or nine times its weight in silver, it was worth in Europe, and especially in western Europe, from ten to thirteen times its weight.

The goods which Asia furnished were neither heavy nor bulky in proportion to their value; and it must have required many ship loads of iron, wool, and timber to pay for a single cargo of the rich commodities of the east. It is not, therefore, probable that any great balance in favour of Europe, to be paid in the precious metals, could arise from the commerce that was then carried on. The plunder of Constantinople by the Venetians and other of the Crusaders probably transferred more metallic wealth to western Europe than all the commerce of the centuries that preceded it: if the statements of Gibbon be correct, that the emperor Alexius paid to the Marquis of Montserrat the enormous sum of sixteen hundred pounds of gold, and that on the second capture, when the city was delivered over to the allied armies,

the booty of the captors, which was brought to the public account, besides what was secretly appropriated by individuals, amounted to eight hundred thousand pounds, it is not improbable that the soldiers of the cross may have carried to the east more of the precious metals than ever returned to that division of Europe. Such was the general eagerness to embark on the expedition, that sovereigns pledged their jewels and even their crowns to obtain money for their equipment, that the nobles mortgaged or sold their estates to raise the requisite sums, and the churches and monastic establishments converted into money their ornamental and sacred utensils of gold and silver to aid the great undertaking of rescuing the Holy Land from the power of the unbelievers. Much of the money thus obtained must have been expended in arms, horses, and other articles which their several countries could supply; much of it would necessarily be expended in long journeys from France, Spain, Britain, and Germany, to the confines of Asia; or in the sea voyage by those who, like the roving Normans, adopted that mode of repairing to the theatre of warlike operations. But still much must have remained and have been applied both by the leaders of the several bodies, and by many individuals in those bodies, to supply the necessaries of life after their arrival in Asia.

When the Crusaders had so far succeeded as to capture Jerusalem and to establish in that city a Christian kingdom, there is good ground to conclude that the revenues raised within it were insufficient to defray the expenditure of the government, but that sums were annually contributed by the several powers which had achieved the conquest to maintain the throne they had erected.

The rude nations of western Europe must have been powerfully impressed with the magnificent objects which the oriental world presented to their view. The thousand luxuries of the east would excite a desire to possess them, and to transfer them as well to ornament their own countries as to serve as memorials of the adventurous expeditions in which they had borne a part. A great portion of what had been acquired as booty in the east would be expended in objects which could not be supplied by the industry of their own countries, but whose value when they arrived there would be estimated as much from the danger and glory by which they had been acquired, as by their rarity, their beauty, or their utility.

It cannot be doubted but that the several crusades tended to soften the manners of those who were engaged in them; that they advanced the knowledge, the civilization, and the industry of Europe, and by these means increased the

wealth of its various nations; but that wealth was of a more substantial and stationary kind than the precious metals which only measure or represent labour, which act as a stimulus to industry both of body and mind, but are, after all, the least part of the real wealth of a community.

We do not suppose, taking into consideration all the circumstances to which we have adverted, that the operation of the crusades was of great influence, either in augmenting or diminishing the stock of gold and silver in Europe, though it gave an impulse directing the course of those metals sometimes from the west to the east, and again at other times in an opposite direction; and thereby produced an exchange of commodities which is one of the natural means of promoting national prosperity.

CHAPTER XIV.

On the produce of the mines and on the state of the coinage about the time of the discovery of America.

FROM the few and indistinct notices of the mines from 806 to the discovery of America which are collected in chap. x. vol. 1., it is scarcely possible to do more than form a conjecture concerning the amount of their produce. The whole period was a time of hostility and turbulence. There was little security for any kind of property, and less still for that which could alone induce the working of mines for silver and gold. None of the mines that are noticed were uninterruptedly wrought, and few of them were worked simultaneously. Some were most productive at one period, and then yielded nothing for centuries; whilst others were discovered and explored and speedily abandoned. The art of separating the precious metals from the ores and from the inferior metals with which they were mingled had been lost since the time of the Roman operations, and were recovered by the same slow and gradual steps by which the

ancients had proceeded. As the mines were worked in countries very remote from each other, the improvements either in the mechanical or scientific process would not be speedily diffused, and though some might advance rapidly, others would do so at a slower pace.

Under the circumstances of the period in question, extending from about the year 800 to 1500, it seems scarcely possible to come to any other conclusion than that the mines of the precious metals on the ancient continent produced far less on the average of the seven centuries than those same mines had done in the century closing in 1800.

The average product of the mines of Europe, including those of the Russian dominions in Asia, did not in the last twenty years of the eighteenth century amount to more gold than equal in value to two hundred thousand pounds sterling, and silver equal to six hundred thousand pounds[1]. Of this gold, more than one half was yielded by the mines of Russia, which afforded none before the year 1704. Of the remainder, the greater portion was extracted from the Austrian dominions, and the remainder in

[1] See Neueste Zahlenstatistik der Europäischen und aussereuropäischen Staaten, page 16. von C. C. Andre— Stuttgart, 1823; also, Algemeine deutsche Real Encyklopädie, under the articles Gold and Silver.

various small quantities from Saxony, Prussia, and Hanover. The mines in those territories in the long period of the dark ages were slightly and irregularly worked, were subject to frequent and sometimes long interruptions, and in their best times never yielded such supplies as they have afforded in more recent years. The silver in the same twenty years which the mines of the old continent produced was nearly on an annual average as follows, viz. Russia £150,000, Austria £200,000, Saxony £100,000, Prussia and Hanover, including the small share of Brunswick in the Hartz, £110,000, and all the other mines about £40,000. It will be seen in the tenth chapter of this inquiry, that the mines in Germany, excepting those in Saxony, were very little worked or even known till the latter end of the period from 800 to 1500; that their greatest produce was but a few years before the termination of the period; and if we take the annual average quantity of the precious metals yielded between 800 and 1500 at a seventh or an eighth of the average of that yielded between 1780 and 1800, when the Russian mines were in active operation, we cannot be very far from the truth, and an approximation to it is all that is attainable in the present state of our knowledge on this obscure subject. If the former calculation assumed in this inquiry be tolerably accurate, that one part

in three hundred and sixty of the gold and silver is annually consumed by wear, and that in the year 800 the stock of those metals had been reduced, from what it was in the time of Augustus, to about thirty-five or thirty-six millions, it will follow that a yearly addition of so small an amount as one hundred thousand pounds from the mines would be a supply fully adequate to replace such consumption.

As far as a judgment can be formed from the few facts that are discoverable, we should be disposed to conclude the whole quantity yielded by the mines during the period would, on a yearly average, amount to one hundred thousand pounds, but that the later years were somewhat more productive than the earlier. We are rather inclined to this opinion by the rise of a few common articles as noticed by Ruding, (vol. i. p. 193 and 194), which appear to have increased in money price between 1150 and 1450, at the rate of nearly one hundred per cent.

There seems thus no reason to suppose that the additional quantity of gold and silver brought into circulation between the years 800 and 1500 was much, if any, more than was required to keep the stock of the last of those years to as high a standard as it had reached in the first of them; and we judge that the quantity must have remained nearly the same from the prices of commodities, when valued by

their weight in gold and silver, not having very considerably varied. The small quantity of gold and silver in existence during the period in question may be inferred from the very small portion of coined money which was issued from the several mints after the operations of coining were performed exclusively by the chiefs of the several kingdoms, or by those to whom that privilege was specially granted.

There are in the records at the Tower, the exchequer, and the mint, some accounts of the latter department in England from a very early period, when our kings exercised the business of coining. The sources from which the supplies of the precious metals were drawn are however by no means accurately indicated. In the reign of Edward II. the silver which was brought to the mint was classed into that which was produced from the royal mines, and into that of foreign countries; and the latter was divided into three other classes, distinguished as *argentum cismarinum*, *argentum transmarinum*, and *bullion*[1].

We have found no accounts by which any calculation can be formed of the proportion which these several descriptions of silver bore

[1] This distribution was preserved in the next reign; after which no traces of it are to be found in the mint accounts at the exchequer. See vol. i. p. 126, of Ruding on coins.

to each other or any way of estimating their whole amount, except by the gross quantity; which is shown by receipts of the exchequer for the bullion delivered to the mints.

If a judgment can be formed from the few specific notices of the sums actually received into the mint from the mines royal, the far greater part of the small sums of money which the mints obtained must have been acquired by foreign trade; for, according to the accounts of William de Wimondham, warden of the mint, it appears that in the year 1294 the mines of Martinstowe, in Devonshire, brought to the mint only 370 pounds of silver, or in our present money, £1100, and in the next year 521 pounds, or £1563; that in the year 1296, 348 miners of the wapentake of the Peak in Derbyshire were sent into Devonshire to assist in working the mines, and the produce was increased to 704 pounds, or £2112. In the year 1299, it appears that William de Aulton, clerk, keeper of the king's mines in Devonshire, finally delivered up his accounts to the exchequer, when those mines seem to have ceased[1]. As the sums here noticed as the produce of the Devonshire mines are so small, we may con-

[1] According to Holinshed, vol. ii. p. 316, the accounts of Wimondham were in his time remaining in the exchequer.

clude that those of Waterford in Ireland, of Somersetshire, and of Cardiganshire, must have been still more minute, and that the chief supply must have been obtained from the foreign commerce of that age, which consisted chiefly in the exports of wool and a few cloths and hides.

The supply of gold to the mint, when it first began to be coined into money in the reign of Edward III., could only have been procured by purchase with silver or with some other commodities, as no accounts appear of any being furnished by the royal or other domestic mines. Although it can have little connexion with the actual supply of gold, it is scarcely possible to pass without notice one of those delusions of the human mind which extensively prevailed in former ages, and has not been wholly dissipated even in the age in which we have lived.

Raymund Lully, who came to England in the reign of Edward III., pretended, and was believed, to possess the power of transmuting the inferior metals into gold and silver. He seems to have been a strange compound of fanaticism and imposture. He was originally a Jew, who had been converted to Christianity and had become a Dominican friar. Cremer, abbot of Westminster, brought him to England, and introduced him to the king, for whom he agreed to exercise his science on condition of the

monarch entering into a war with the Turks. The king was too much occupied with his wars in France to attack the Turks, and Lully refusing on that account to continue his operations in making more gold, was in consequence of it imprisoned and kept in durance a long time in the Tower. It seems to have been believed by Ashmole[1], upon the testimony of Norton and Hermes Bird, that this man actually made gold whilst a prisoner in the Tower; and besides giving credit to this from tradition, he mentions as a corroborative proof, that the money coined from this gold had on the reverse "a cross fleury with lioneux, and the inscription, *Jesus autem transiens per medium eorum ibat*[2]; intimating, that as Jesus

[1] See Ashmole's Theatrum Chemicum Britannicum, p. 442—467.

[2] These words were supposed in the time of the traveller Mandeville, who began his journeys in 1320, to be a charm sufficient to ensure protection against wars and against thieves. His words are, "And an half myle fro Nazareth is the lepe of our Lord: for the Jewes ladden him upon a highe roche, for to make him lepe doun, and have slayn him: but Jesus passed amonges hem, and lepte upon another roche; and zit ben the steppes of his feet in the roche, where he allyghte. And therefore seyn men, whan thei dreden hem of thefes, on ony weye or of enemyes, 'Jesus autem transiens per medium illorum ibat:' that is to seyne, Jesus forsothe passing by the myddes of hem, he wente: in tokene and mynde, that oure Lord passed thorghe out the Jewes crueltee and scaped safly fro hem; so surely mowe men passen

passed invisible and in a secret manner through the midst of the Pharisees, so *that* gold was made by an invisible and secret art amidst the ignorant." Some instances of faith in this delusive necromantic art may be traced in the statutes and other public documents almost to the first year of William and Mary, when the act of the 5th of Henry IV. was repealed which had been enacted to prevent the "craft of the multiplication of gold."

From whatever sources the supply of gold and silver to the mints of this kingdom may have been drawn, the quantity received in them from the period when regular accounts have been preserved[1] will show how very small was the amount.

The clear accounts commence with the reign of Edward I. in 1272, between which and the reign of Edward II. in 1307, the silver received amounted to

the perile of thefes. And then sey men two vers of the Psautre. Irruat super eos formido et pavor, &c. And thanne may men passe with outen perile." Mandeville's Travels, p. 137, edit. 1727.

[1] See Ruding's Annals of the Coinage of Great Britain, vol. i. p. 135.

	In money of that period. £.	s.	d.	In money of the present time. £.	s.	d.
The following sums[1] .	15,992	13	2	46,177	19	6
Reign of Edward II, from 1307 to 1327[2] .	166,232	4	2	498,696	12	6
Reign of Edward III., from 1327 to 1347[3] .	22,253	12	3	66,760	16	9
The same reign from 1347 to 1354[4] . .	12,403	16	8	33,060	1	6
The same reign from 1354 to 1377[5] . .	121,018	15	6	290,443	19	5
The reign of Richard II., from 1377 to 1399 .	2,311	6	3	5,546	9	4
The reign of Henry IV., from 1399 to 1413 .	4,248	17	1	10,196	18	4
The reign of Henry V., from 1413 to 1422[6] .	9,026	0	2	21,662	10	0
The reign of Henry VI., from 1422 to 1461[7] .	29,892	3	5	59,784	6	10
The reign of Edward IV. and to the accession of						

[1] Of this amount the mint of London received £8018 18*s.*; that of Dublin £6053 1*s.* 5*d.*, and Canterbury £1920 13*s.* 9*d.*

[2] London received £92,339 12*s.* 2*d.*, and Canterbury £73,892 12*s.*

[3] In the 20th year of Edward III., the pound of silver which had before been coined into 20*s.* was made into £1 2*s.* 6*d.* In this period London received £22,115 7*s.* 9*d.*, and Canterbury £138 4*s.* 6*d.*

[4] The whole of this was delivered in London. In the 27th year of Edward III. the pound of silver was made into £1 5*s.*

[5] Of this sum £5,272 was delivered at Calais, £1,892 5*s.* 9*d.* at York, and the remainder in London.

[6] In the reign of Henry 5th the pound of silver was coined into thirty shillings.

[7] Till the last year of this reign the money continued at

	In money of that period. £.	s.	d.	In money of the present time. £.	s.	d.
Henry VI., from 1461 to 1485 [1]	47,843	1	0	76,548	1	6
The reign of Henry VII., from 1485 to 1509 [2]	49,367	12	0	76,320	10	6

From the commencement of the reign of Edward I. in 1272, to the death of Henry VII. in 1509, a period of two hundred and thirty-seven years, we thus find the amount of the silver received at the exchequer for the mints, when reduced to its money value of the present time, did not exceed nine hundred thousand pounds.

The gold received in that period is only to be ascertained with any precision from the 18th year of Edward III., 1345.

	In money of that period. £.	s.	d.	In money of the present time. £.	s.	d.
During the remainder of that reign there was received	38,405	6	0	83,430	18	6
In the reign of Richard II.	4,785	2	0	10,403	15	4
Henry IV.	8,372	13	0	19,001	16	0

the same rate as in the preceding, but afterwards the pound of silver was coined into thirty seven shillings and sixpence.

[1] During the reigns of Richard the 2d, and of Henry the 4th and 5th, all the silver was delivered in London. In the reign of Edward the 4th, £1556 was delivered at York, £903 3*s.* at Bristol, and the rest in London.

[2] During this reign the money continued at the rate of thirty-seven and sixpence to the pound of silver

	In money of that period. £.	s.	d.	In money of the present time. £.	s.	d.
In the reign of Henry V.	22,610	16	0	44,221	12	0
Henry VI.	40,800	12	0	81,601	4	0
Edward IV.	102,650	10	0	164,240	18	0
Henry VII.	27,550	18	0	44,008	14	0
The silver thus brought to the mints being in our present valuation of that metal				1,185,198	0	0
And the gold . . .				446,908	0	0
Makes the whole quantity in the 237 years from 1272 to 1509 . .				1,632,106	0	0
Or average quantity annually .				6,886	10	0

Although there is doubtless some obscurity in the original documents in the Exchequer from which Ruding derived his information, it is by no means probable that there should be any such material error in them as to affect the accuracy of the inference here intended to be drawn, viz. that the amount of coined gold and silver money at the time of the discovery of America was very minute when compared with the quantity which it has reached since that period, and with that which must have been in existence when the Roman empire was at the height of its grandeur and power.

To show the contrast in a more striking point of view, the following table exhibits the amount of money coined in this kingdom during the several reigns after the products of the mines of the Spanish and Portuguese dominions in America

had been distributed among the various nations of the civilized world, which distribution was scarcely accomplished before the commencement of the seventeenth century.

Coinage of Great Britain in each reign, from the accession of James I. in 1603, to that of his present Majesty in 1830:—

James I.	Gold .	3,666,389	
	Silver .	1,807,277	
			5,473,666
	Average of the 22 years . .		248,800
Charles I. including the Common-wealth.	Gold .	3,465,188	
	Silver .	9,776,544	
			13,241,732
	Average of the 35 years . .		378,338
Charles II.	Gold .	4,177,253	
	Silver .	3,722,180	
			7,899,433
	Average of the 22 years . .		358,611
James II.	Gold .	2,113,638	
	Silver .	[1] 2,115,115	
			4,228,753
	Average of the 4 years . .		1,057,184
William and Mary and William III.	Gold .	2,341,889	
	Silver .	7,093,074	
			9,434,963
	Average of the 12 years . .		867,246

[1] In this is included £1,596,799 of base money coined for Ireland.

Reign of Anne.	Gold .	2,484,531	
	Silver .	618,212	
			3,102,743
Average of the 13 years		. .	238,672
George I.	Gold .	8,492,876	
	Silver .	233,045	
			8,725,921
Average of the 14 years		. .	623,380
George II.	Gold .	11,662,216	
	Silver .	304,360	
			11,966,576
Average of the 37 years		. .	361,258
George III. from the commencement of his reign to 1809 inclusive.	Gold .	66,214,774	
	Silver .	63,419	
			66,278,193
Average of the 50 years		. .	1,525,564
George III. from 1809 to his demise.	Gold .	9,538,669	
	Silver .	6,933,346	
			16,472,013
Average of the 11 years		. .	1,497,536
George IV.	Gold .	36,147,700	
	Silver .	2,216,168	
			38,363,868
Average of the 9 years		. .	4,262,652

It would be delusive to compare the period between 1272 and 1509 with that between 1603 and 1829, in order to induce a calculation of the proportionate quantity of gold and silver in the respective periods. In the first of them the annual sum being only £6,886, and in the latter

the enormous amount of £819,415, we might be led to conclude that the actual quantity of the coins in circulation was one hundred and twenty-two-fold greater in modern times than before the beginning of the sixteenth century. Thus, on the supposition already assumed, that the stock of gold and silver at the discovery of America amounted to about thirty-five millions, our drawing conclusions from this contrast alone would lead us to calculate the precious metals now in existence at the incredible, if not impossible, amount of four thousand eight hundred millions, whereas we are well warranted in concluding that they do not amount to more than about one tenth of that value.

This great discrepancy between the metallic wealth actually in existence, and that which was annually converted into the current coin of England, may be accounted for in several ways. In the early period of our coinage a large proportion of foreign coins had been introduced, especially of gold, and that long before any records which remain notice the fabrication of either gold or silver coins in England. In the time of the Anglo-Saxons and of the Anglo-Normans, the gold of the eastern empire at Constantinople had travelled to the west of Europe, and was commonly used in all the larger operations of commerce. The coin known by the name of Bezants was of greater purity than any

of that which issued from the mints of Germany or France. Its fineness was of twenty-four carats, whilst the gold which was coined in France in the reign of Philip III., about the year 1230, was only of the fineness of twenty-three carats[1]. Besides these coins from Constantinople, the gold pieces struck in France were introduced in considerable quantities into England after the conquests made by our ancestors in France. The agnels of the reign of St. Louis, sometimes called mutones or multones, from having on one side a lamb with a banner, and the words *Agnus Dei qui tollis peccata mundi, miserere nobis,* and on the other a cross with the motto *Christus regnat, vincit, imperat,* were of gold of the fineness of twenty-three carats and a half. These and other coins of a cotemporaneous period circulated, or rather passed in large payments, in England for a long period; whilst that which was subsequently coined in France from the reign of Philip le Bel, which commenced in 1285, to a later period, being reduced in purity from one to two carats below the standard of St. Louis, had little circulation out of the country where it was issued. The Angelots were a coin fabricated by the English in Paris, whilst they exercised the government of France under the reign of Henry V., and in

[1] See Abot de Bazinghen, vol. i. p. 104, and vol. ii. p. 109.

the minority of Henry VI. These pieces of gold were of great purity, and when transferred to England maintained their credit during a long time. Bazinghen, who relates whatever concerns the coinage of his own country, says on this subject: "On lit dans un ancien manuscrit, que le Roi d'Angleterre fit faire cette monnoie, que étoit d'or fin, à plus haut titre qu' aucun de ses voisins, esperant par ce moyen aliéner des François de Charles VII., qui en même tems avoit été contraint d'empirer considerablement sa monnoie: ce que Henry VI., ne fit point pendant qu'il fut maitre de Paris." Vol. i. p. 53.

Besides the money which was of competent purity, a great number of coins of adulterated gold and silver was introduced from foreign countries, which, in spite of all the precautions to prevent it, circulated before they were detected a longer or shorter period, according to their better or worse imitation of the domestic coinage. The city of Luxemburg, or as it was then called, Lushburgh, seems to have been the chief place for manufacturing the base coin, if we can judge from a petition of the Commons in the parliament held at Westminster in 1344, which states that "many merchants and others carried the good money out of the kingdom, and brought in its room false money called Lusshebournes, which were worth only eight shillings in the pound or less, by which means those who

took them at a low price to utter again were suddenly, wrongfully, and beyond measure enriched; whilst those who were unable to distinguish the said money were cheated and impoverished, and the whole realm was fraudulently filled with those base coins[1]."

The Commons prayed not merely that the ordinary magistrates might be urged to try and punish the offenders, but the severer measure of seizing and confiscating the estates of all "who were notoriously suspected," and afterwards "to inquire of the truth concerning them;" and this was urged because the parties were so wealthy, that otherwise they might escape punishment, and because the king would be enriched by the wealth which the suspected persons had fraudulently acquired "as in conscience he ought to be[2]."

The laws which existed before to prevent the introduction of base coin appear to be as severe and as rigorous as any that could be enacted, and if they were found insufficient, we must conclude they were so flagrantly unjust that

[1] These coins are noticed thus in Piers Plowman's vision.

"As in Lushburth is a luther alay, yet lokith like sterling,
The mark of the money is good, and the metal feble.
So fareth it bi some folk now, they have a faire speech,
Crowne and christendome, the kinges mark of heven,
And the metal that is mans soule, with sinne is foule alaied."
Fo. 82, b.

[2] Rolls of Parliament, vol. ii. p. 16.

they could not be executed. It appears by a law passed in the 20th of Edward III. (1292), that no man could bring money or land in any part of England except at Dover, Sandwich, London, Boston, or Southampton, where officers were appointed by the king to examine all the money of the passengers who landed from foreign countries, and were empowered to seize all that was adulterated or deficient in weight. There were other severe conditions enacted in the statutes of the same reign, entitled *Statutum de Monetâ*, *Statutum de Monetâ parvum*, and *Articuli de Monetâ*.

A rigour much "beyond the laws" was however practised in those early ages. It fell sometimes on the Lombards, sometimes on the goldsmiths, but with the greatest weight on the unfortunate Jews. Knighton says, that the king convened a parliament, in which the Jews were convicted of clipping and corrupting the coin, and they were banished never to return, principally on account of their unbelief and the falsifying which the Christians harshly imputed to them; and that the Commons gave to the king the fifth penny of all their moveables that the measure might be carried into execution without delay[1].

Another historian of the same age states, that this banishment of the Jews was the con-

[1] Knighton, column 2466.

sequence of a complaint of the lords of parliament to the king, of the malice and perfidy of that people, of their usury, their forgeries, and their debasement of the coin. Whatever proofs may have been given of these charges, the king and council resolved that on a fixed day and hour the whole should be apprehended in every city of the kingdom and be immediately banished. A part of their property was confiscated, and a part was allowed to be carried with them. Some of the wealthiest of the race loaded a ship with vast treasures. When they had nearly reached the mouth of the Thames, the master of the ship cast anchor, and at low water the vessel was dry on the sand. He then persuaded the Jews to walk with him on the sand, telling them that the tide would not flow for a long time. Having led them as far as he could from the ship, and finding the tide was coming in, he stole away from them and ascended the ship's side by a rope.

The wretched Jews, when they discovered their situation, called to him for help; but he mocking them, bade them call on Moses who had conducted their fathers through the Red Sea, and thus left them to perish. He then returned to the king, to whom he related what had happened, and obtained from him both favour and reward[1].

[1] Hemingford, sub anno 1290.

Such is the story which is told by the historian, without any of those indignant expressions which the moral feelings of the present day would extort from the most hardened persecutor. It seems to be told rather as a good joke than with that kind of feeling which every virtuous mind would be now impressed with, in recounting the sufferings of the most guilty offenders against the laws of society.

Another cotemporary writer has however given a different statement of the conduct of the king, and much more favourable to his character; for he relates, that when the king heard the story he condemned to the gallows all who were concerned in the robbery and murder[1].

Notwithstanding the banishment of the Jews, the establishments for strict examination, and the severe penalties which the king, at the requisition of his parliament, enacted, the base money continued to flow into the kingdom in a most copious stream. These coins were brought into the country by foreign merchants, probably concealed in goods. They were distinguished by the names of pollards, crocards, scaldings, brabants, eagles, leonines, sleepings, and various other denominations[2]. They were chiefly white

[1] Wilkes' Chronicle, p. 122, as quoted by Ruding in his first volume, p. 380.

[2] Walsingham says, speaking of the base coins, "Gallici nempe hanc monetam fabricaverunt; quæ non erat argentea

money resembling silver, but very artificially compounded of silver, copper, and sulphur, so that the silver did not form more than one-fifth of the weight.

When these fraudulent pieces had got into general circulation, they became so notorious that the officers of the crown, who had probably connived at or aided their introduction, gave information concerning them; and they were ordered to be delivered up to the king, who professed to pay the full value of the silver they contained, and to recoin it into legal money. How they were estimated does not appear, but it is very certain that by the operation of thus changing the base for the legal coins, Henry VII. drew into his exchequer a considerable profit.

Several of the parliaments which were summoned to meet between the reigns of Edward I. and Henry VII. were chiefly called for the purpose of considering the state of the circulating currency, or to enact laws to prohibit the export of the domestic coins, or of gold and silver plate and bullion, to prevent the introduction of foreign coins without due examination of their value before they were allowed to be circulated, or to enact the punishment to be inflicted on such as were proved guilty of de-

sed superficialiter deargentata, et currebat in locis plurimis loco sterlingorum, multique decepti fuerant per eandem."—Hist. Ang. p. 77.

basing, or clipping the coin, of secretly introducing foreign money, or of committing forgery or usury.

The whole history of the period tends to show, that the money in England of domestic coinage formed but a small part of that which was in existence within the kingdom, and it has been dwelt upon here at greater length than it would have otherwise been entitled to occupy, because it appeared necessary to account for the enormous difference in the extent of English coinage between the series of years which preceded the discovery of America, and the same length of time in the present and two preceding centuries.

END OF VOL. I.

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